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# BLUE JAY

June 1993

*Blue Jay*, founded in 1942 by Isabel M. Priestly, is a journal of natural history a conservation for Saskatchewan and adjacent regions. It is published quarterly by t **Saskatchewan Natural History Society, Box 4348, Regina, Saskatchewan, S4 3W6.**

CN ISSN 0006-5099.

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**Cover:** Red Fox. Photo by Doug Gilroy.

Published by the Canadian Plains Research Center, University of Regina. Printed by Merit Printing, Regina, Saskatchewan, on 10% recycled paper.

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# AGRICULTURAL POLICY REVIEW PART 2: WHEAT BOARD QUOTA SYSTEM

FRED THORNTON, JOCE BOWMAN, and DAVID STRUTHERS, Western Resource Management Associates Limited, Box 4-B Site 2, Yorkton, Saskatchewan. S3N 2V4

The roots of the Canadian Wheat Board go back to the early 1900s when farmers operated their own wheat cooperatives. During the First World War, the federal government established a national sales agency, the Board of Grain Supervisors, to market wheat. When the war ended a Canadian Wheat Board was temporarily established to help the grain market revert to peace time conditions. This board operated for only one year and, during that time, introduced the concept of centralized selling to farmers.

Prairie farmers recognized two major advantages from such a marketing agency:

1) The initial guaranteed minimum payment received when their wheat was delivered to country elevators; and

2) The concept of price pooling, where all profits from the sale of wheat were returned to the farmer and each farmer received the same price for the grain and grade delivered.

Price pooling was particularly attractive because it smoothed out the annual highs and lows of fluctuating grain prices. Farmers who were unable to deliver grain when prices were at their highest did not have to suffer large losses.

Farmers began to lobby the federal government for the establishment of a permanent wheat board. This pressure, and the economic conditions arising from the depression, led to the creation of the present Canadian Wheat Board (CWB) by an act of Parliament in 1935. The CWB originally marketed only wheat and use was voluntary. In 1943 it became compulsory for farmers to market their wheat through the CWB. During 1949, CWB powers were extended to include oats and barley, however, oats reverted to a non-Board grain in 1989. The CWB is the world's largest grain marketing board and merchandiser of wheat and barley. It is one of Canada's largest corporate enterprises and our single, largest exporter.

**The CWB's Role** The CWB is western Canada's only marketing agency for wheat and barley sold on export or domestic markets for human consumption. Wheat and barley suitable only for domestic livestock feed can be sold through the CWB or through independent companies. Other cereal grains and oilseeds grown in western Canada (i.e., oats, rye, flax-seed, canola) are considered non-Board grains and marketed through independent grain companies. However, the CWB sets delivery quotas for these grains. These quotas regulate the flow through the elevator system at rates which meet short-term market requirements and provide producers with an equal opportunity to deliver both Board and non-Board grains.

The CWB provides farmers with an initial payment when they deliver grain to an elevator. The initial payment is generally set below prevailing world grain prices. The federal government is responsible for setting the level of the initial payment and guaranteeing this payment to farmers. This initial payment can be increased during the crop year, but it cannot be reduced. If an increase occurs, adjustments are sent to farmers who have already delivered grain.

The CWB sells the grain and pools the total returns from those sales. The pool accounts are wheat, durum wheat, barley, and designated barley (high quality barley for malting or pearling). The CWB then distributes the final payment to the producer based on the amount and grade of grain delivered. Each farmer receives the same rate of payment for the same type and grade of grain, no matter when it is delivered in the crop year. In some years, revenue from grain sales is less than the initial payment plus marketing costs. When this happens, farmers do not receive a final payment for their grain and the federal government must cover the cost to the pool account.

**CWB Structure** The employees of the CWB are not civil servants. All salaries and operating expenses of the Board are paid by farmers rather than the federal treasury. Board commissioners and senior executives meet regularly with a Producer Advisory Committee, which is elected by farmers. The CWB holds annual meetings throughout the prairies where farmers' concerns can be presented.

The CWB has ties to the federal government. The government is responsible for setting the initial price to farmers and also appoints commissioners to the Board. The Board reports to a designated minister and produces an annual report on its operations. The federal government guarantees payment on credit sales made by the Board.

**The CWB Quota System** The CWB cannot take delivery of all the grain at harvest, therefore, it establishes quotas on grain deliveries to bring forward the amount of grain necessary to meet market demands. Every farmer has a quota base that is used to calculate the quantities of grain that can be delivered when quotas are announced. The quota base is calculated using the following parameters:[2]

1) Acres of farmland seeded to the six quota grains (wheat, oats, barley, rye, flax, and rapeseed);

2) Acres of farmland in summerfallow;

3) Acres of farmland planted to miscellaneous crops (all crops other than quota crops and perennial forage); and

4) Acres of farmland seeded to perennial forage. Forage acreage in the quota base cannot be more than one-third of the total acreage in quota grains, summerfallow, and miscellaneous crops. If the acreage

of perennial forage exceeds the allowable one-third limit, the surplus forage acreage cannot be used in the quota base calculation.

To determine the total acreage eligible for quota allotment, the acres of land in any of the six quota grains, summerfallow, and miscellaneous crops are added together plus one-third of that total or the number of acres in perennial forage (whichever is the smaller number). If the summerfallow plus miscellaneous crop acreage is less than one-third of the total area seeded to the six quota grains, producers are entitled to bonus quota acres. Bonus quota acres are determined by calculating one-third of the area seeded to the six quota grains minus the acreage of summerfallow and miscellaneous crops. The resulting figure constitutes the producer's bonus quota acres and are added to his total quota allotment. Bonus quota acres allow producers who continuous crop to deliver a greater percentage of their total production. Land which has been newly broken becomes eligible for inclusion in the calculation of assignable quota acreage in the subsequent crop year.

The manner in which the quota allotment acres are distributed amongst the quota grains produced by the farmer is totally at his/her discretion.[8] For crops such as wheat, as a rule, farmers assign at least twice as many quota acres than are actually seeded. This method of assigning quota acres provides farmers whose yields are well in excess of annual quota allotment a greater opportunity to sell grain stocks.

**Potential Impacts to the Landscape** Despite the benefits of its marketing services, some of the CWB procedures, particularly the grain quota system, were designed with little consideration for long-term environmental consequences. A number of studies, over the past ten years, have identified the negative impacts of the quota system on the resource base and the environment.[1,3,4,5,6,8] Some of these impacts are:

1) **The quota system encourages excessive summerfallow.** The inclusion of summerfallow acreage in the quota acreage calculation may encourage a greater extent and frequency of summerfallowing, a practice which leads to increased soil salinization, erosion, and lower soil productivity. Quota deliveries are based on the number of acres cultivated by the producer as opposed to the number actually seeded to quota crops. Esquirol suggests that because it is more economical to produce to the limit on some fields and save input costs on others, many farmers have seen fit to cultivate all their land and then let some remain fallow.[3] Farmers receive the benefit of having the acres included in the calculation of their quota, without the cost of inputs that a seeded acre would have.

Bond summarizes the CWB's response to this impact.[1] The CWB notes that: (1) quota policy is less likely to increase summerfallow due to the low volume of stored grain in recent years; and (2) that summerfallow practices for soil moisture retention remain essential for farming in arid regions of the prairies. The CWB suggests that the most expedient approach to reducing soil degradation would involve increased extension efforts to promote good soil husbandry and soil conservation measures on land in fallow, such as reduced tillage and stubble management.

2) **The quota system encourages the cultivation of marginal land.** Currently, producers are granted rights to market a certain number of bushels for each unit of land which is considered cultivatable. Therefore, there is an economic advantage to break land in order to obtain additional quota acres. The stipulation that land must be broken before it can be assigned quota acres encourages farmers to consider native lands as a potential reserve for expanding their quota base.[8] The continuing expansion of cultivation into native lands only aggravates the environmental degradation of the prairie landscape. Given the high degree of agricultural alteration that has already taken place on the prairies the remaining wetlands, shrublands, and other sensitive areas would, from a social, aesthetic, and ecological perspective, best be retained in their native state. Zittlau claims that, with the push to continuous cropping as a more sustainable form of agriculture, the cultivation of marginal land could become an increasingly attractive option for some farmers wishing to expand their quota base. Continuous cropping results in increased production and a reduction in summerfallow acres. If the additional seeded acreage is used to produce Board grains, the increased volume could result in large surpluses, smaller quota releases, and reduced delivery opportunities for individual farmers. In reaction to this concern the CWB introduced the bonus quota acre calculation in an attempt to promote extended crop rotations. However, the increase in quota acreage achieved through this program is not a disincentive to bringing additional land into cultivation.

3) **The quota system does not allocate marketing rights according to the productivity of the land.** The current quota policy permits a farmer to sell a specific number of bushels per unit area, regardless of his actual yields. Such a system does not make allowances for the differences in productivity between farms and agricultural landscapes. A farmer who produces consistently smaller yields, in a climatically marginal area and/or on lower capability soils, will be able to deliver a larger percent of his production than a farmer in a higher yielding area. Bond suggests that this tends to cause a shift of grain production away from areas of higher rainfall and fertility to areas of lower soil capability that are more vulnerable to drought.[1] In areas of higher production, farmers compensate for their inability to deliver the same percentage of their total wheat production by shifting cropping patterns away from grains to specialty crops.

4) **Constant quotas deter the implementation of highly efficient production techniques and may discourage increases in productivity on potentially productive land.** Under an acreage-based system there is no incentive to increase yields since the percent of deliverable production does not increase. Increased production results in more on-farm grain storage. Practices helping to rebuild soils are not rewarded, but are actually discouraged, since the extra production resulting from good soil management is not included in the quota calculation. As well, constant quotas may have regional impacts on soil degradation. Areas of higher rainfall are generally most suitable for continuous cropping and the elimination of summerfallowing. These areas have higher yields, but constant quotas reduce the proportion of the crop that can be sold there, in comparison to more marginal areas, thereby providing the least incentive to reduce summerfallow in areas with the best

potential to do so.

According to Bond the CWB feels that:[1] (1) Land in summerfallow has been steadily declining, particularly in areas of the prairies receiving adequate rainfall; (2) wheat yields have tended to increase reflecting, at least in part, more intensive farm management; (3) many farmers choose, on their own accord, to diversify their operation into other crops and livestock in order to reduce their economic vulnerability to grain markets; and (4) along with the quota system, the CWB also offers contracts for certain grains (e.g., soft white spring wheat), some of which can only be grown in certain areas. As a result, these contracts allocate marketing rights according to the productivity differences between farm areas.

5) **CWB policies are disincentives towards diversification, particularly to livestock and forage production.** In fact, they pressure farmers towards specialization in grain, particularly wheat and barley. This occurs because of the emphasis that the quota system places on the production of Board grains for export. In addition, the bonus quota acres program negatively affects crop diversification. The bonus acres calculation actually penalizes producers having more than one-third of their annually seeded acreage devoted to specialty crops. Such practices tend to increase the area in Board grains and reduce the production of specialty crops.

The CWB has observed that the area seeded to specialty crops on the prairies is increasing, thereby indicating that the bonus acres program has not reversed the trend.[1]

6) **The quota system does not encourage extensive use of forages in areas of intensive livestock production and areas prone to soil erosion.** Total forage acres can only comprise one-third of the total crop acreage for the calculations of the quota base.

Most of the above problems have been examined in the ongoing process of agricultural policy review, but none have been resolved.

**Possible Solutions** Esquirol recommends that the quota system be examined with a view towards making the system a conservation facilitator.[3] To accomplish this, he recommends that grain deliveries from farms be based on a volume, rather than an acreage, basis. Girt supports this approach.[4] Also, the Saskatchewan Wetland Conservation Corporation (SWCC) includes it, as an option for modifying the quota system, in their policy review: An Inventory of Agricultural Policy Impacts on Wildlife and Options for Reform.[7]

In such a system, farmers would set delivery contracts with the CWB in which they would commit the amount of grain they wish to sell during a particular delivery period. The CWB would then call forward a percentage of the grain offered during that time period. Esquirol states that such a system would ensure the primary objectives of the quota system (i.e., enhancing marketability and providing equity in delivery opportunities).[3] Productivity would be rewarded because each producer would contract his actual inventory, regardless of the area of land used in the production of grain. The cultivation of fragile or unproductive land would become much less viable, economically.

Esquirol sees other important

benefits arising from a volume-based quota system.[3] These include the encouragement of sound soil management techniques such as manure application, shelterbelts, specialty crops in rotation, and the prudent use of forages. These techniques would provide increased delivery opportunities through an increased production volume. A volume-based quota system may result in the regrassing of eroded soils, reclamation of saline areas through the seeding of salt-tolerant perennials, and reassessment of the destruction of wildlife habitat on marginal land since these areas do little to add to the volume of production.

There is no reason why a more intensive, rather than extensive, production program should result in decreases in production. If the monies used to produce grain on marginal land were applied to optimize production through sustainable soil and landscape management on more fertile acres, total production would likely remain the same, or perhaps even increase.

Zittlau proposed three modifications to the quota system:[8]

1) Remove from the quota acreage formula any provisions which encourage farmers to invade marginal lands;

2) Modify the practice of including cultivated summerfallow in the quota acreage formula; and

3) Alter the quota acreage formula to permit the inclusion of native pasture and/or uncultivated lands in quantities equal to a predetermined percentage of cultivated acreage.

Zittlau also recognizes that, prior to implementing any changes to the quota system, the full economic implications of those changes must be considered.[8] If this were not done, there could be economic upheavals that could create even more serious environmental problems. To minimize economic complications that may arise Zittlau recommends that changes be implemented over a 5 to 10 year transition period.[8]

The SWCC outlines an additional option for modifying the CWB quota system on very small acreages.[7] This option would modify the existing quota system to include “marketable habitat quota acres.” These habitat quota acres would be leased, on an annual basis, by some other agency or interest group (e.g., Ducks Unlimited, SWCC, etc.). This option is specifically aimed at securing uplands associated with good wetland habitat. Following an application, assessment, and approval procedure, eligible farmers could receive 3 to 10 acres of Habitat Quota for each acre converted to perpetual habitat. The amount of land placed in such a plan would be negotiated as would the ratio of quota acres to habitat acres.

In summary, the CWB quota system was enacted to standardize delivery of grain to supply markets that the CWB had developed. However, this system, in ensuring grain supplies for short-term market growth, is detrimental to the long-term view of sustainable land productivity. In association with other agricultural policies, the quota system has moulded a production system on the prairies that realizes short-term subsidy benefits from the cultivation of marginally productive land, continues to allow soil erosion through summerfallow, and encourages the production of annual crops in areas with inadequate climate. The agricultural industry of today needs to focus its energy on the major issues of sustainability and diversification and discard the antiquated CWB quota system that discourages both sustainable soil and land management and diversification from grain production.

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[This article is published under the auspices of the Saskatchewan Natural History Society - Endangered Species and Spaces Committee and is the second in a four-part series on the effects of agricultural policy in Saskatchewan.]

Never mind Northern Spotted Owls, hunters in the United States could be an extinct species within 35 years, according to a sociology professor at the University of Wisconsin-Madison. Tom Heberlein, who is also a deer hunter, predicts:

- The aging of society in general and hunters in particular will decimate the present legions of hunters.

- Youngsters, distracted by other recreational pursuits, will simply not replenish the hunting ranks.

- Declining populations in rural areas – the cradle of hunting – will reduce further the pool of potential hunters.

- Animal-rights activists have, to some extent, turned public opinion against hunters.

- *The Globe and Mail, 8 December 1992.*

# THE JOYS AND TRIALS OF A NATURALIST

DONALD F. HOOPER, Box 40, Somme, Saskatchewan. S0E 1N0

## Joys

I am absolutely overwhelmed with the five awards that have been presented to me since October of 1991 in recognition of my work in natural history and conservation. The real thriller for me is to add something new to the Saskatchewan list. It seems that instilled in the mind of every naturalist is a mania (an excessive/persistent enthusiasm) to explore and find the unknown in the great outdoors.

Some of my firsts are as follows:

1955 - Mexican Sulphur (*Erema mexicana*) (a stray tropical butterfly);

1958 - a ground beetle (*Bembidion lanciphoroides*); and

1990 - first Nashville Warbler nest for Saskatchewan.

With Dr. Vern Harms, Les Baker of Carragana and others, I have shared in finding 10 new plant species for the province.

## Trials

**Worried Neighbours** When I take a summer day to head for the woods some of my neighbours are concerned about my farm work. To be a naturalist is often to be grossly misunderstood. Many say that one should be paid by the government for time and expenses. It is odd that they don't stop to think of all the money that they spend in a year on leisure (sports, hunting, and trips to Disneyland, etc.).

**Grounded by an Owl** In 1956 I was climbing up a large aspen tree to band and photograph a young owl in the nest. When I got about 4 m up, without warning, the adult owl on silent wings descended upon me, striking me like a sledge hammer on the back of my head with the soles of its feet. The bird clawed through the top and bottom eyelids of my right eye as it flew past. Needless to say I dropped to the ground stunned. I was not going to give up, so the next day I climbed the tree with a cardboard box over my head and safely completed my assignment.

**My Camera Goes Under Water** Around 1960 I set up my camera on a tripod along the edge of a mucky cattail slough. I intended to trip the camera shutter with an air bulb and a long hose when a bird came into proper position for a picture, but suddenly the tripod started tipping sideways in the muck. I ran to rescue my camera, but to my dismay it settled with a splash into the water. The camera had to be sent to Vancouver for cleaning and repairs.

**Suspected of Rustling** While travelling in Alberta in 1970 I stopped along a road allowance beside a community pasture. It was a nice prairie meadow with a beautiful array of flowers. I got out my net and proceeded to check for butterflies. After a while a squad car pulled up on the highway; the officer came over and

*Donald Hooper with some of his nature specimens in the 1960s.*

asked me what I was doing. When I told him that I was collecting butterflies, he looked very suspiciously at me and wrote down my name and license number. Local residents told me later that some cattle rustling had taken place recently and that the police were determined to catch the crooks.

**Mouse Trapping Troubles** My brother Ronald is an entomologist in the Saskatchewan Museum of Natural History. From time to time I find some rare species of insects or mammals to donate to the museum. In March 1986 I collected a specimen of Water Shrew (*Sorex palustris*) near Somme.

In October 1986 I saw some mice go down their holes in a wet mossy swamp south of Somme. I thought that this could be wet enough for the Northern Bog Lemming (*Synaptomys borealis*), so I set traps and in the morning I was surprised to find that I had three specimens of the common Red-backed Mouse (*Clethrionomys* spp.) which I didn't expect in so wet a place. By this time I had a bad case of mouse trapping fever and thought I must get a bog lemming. The floating bog near Greenbush campsite should be a suitable habitat.

The very next day I stopped my truck at the Greenbush bog, and away out from the highway I found some mouse holes on an island of tamarack. I set four traps then proceeded east to Hudson Bay. After doing some shopping and having supper in town I returned to check my traps, parking off the highway at the approach of the Greenbush campsite. Leaving the parking lights on, I took a flashlight and found that I had another Red-backed Mouse in one of the traps. I muttered as I gathered up the traps and the mouse. "What is this mouse doing in so wet a place?" I wondered.

While I was walking through the wet bog toward the truck a police squad car pulled up on the highway. I thought to myself, "He will never believe me." The season was open for deer hunting north of Highway 3, but not on the south side where I was. He would think that I was dragging out a deer. When I got to my vehicle I tossed the mouse and flashlight in and got the motor started and put the headlights on. With the red light flashing, the squad car pulled in behind me. I quickly got out of my truck and went back to where the policeman was. The officer opened his car door and remained sitting with his dome light on.

He asked, "What were you doing out there?"

I replied, "Trapping mice." He then looked me over. His eyes went from my head to my feet and then back again.

He said very slowly, "T-r-a-p-p-i-n-g mice?"

I answered enthusiastically, "I was hoping to catch a Northern Bog Lemming."

He again repeated slowly, "A n-o-r-t-h-e-r-n b-o-g l-e-m-m-i-n-g?" Then he added, "There are a lot of deer in these parts." (I guess he was suspicious of me poaching).

I explained to him that I was Donald Hooper, a naturalist from Somme, and did all kinds of unusual things in my nature studies. After telling some of my exploits I said, "You must have read about me in the *Hudson Bay Post Review*."

He then replied, "I never heard of you in my life."

So I said, "I'll show you the mouse if you like."

The officer said, "I think that I had better be going." He went off in the darkness toward Hudson Bay. I have often wondered if he ever told the boys at the station about the strange mouse trapper at Greenbush.

* * *

Ohio Senate Committee, 1857: "The passenger pigeon needs no protection. Wonderfully prolific, having the vast forests of the North as its breeding grounds, traveling hundreds of miles in search of food, it is here to-day and elsewhere to-morrow, and no ordinary destruction can lessen them or be missed from the myriads that are yearly produced." *Peter Mattiessen. 1959. Wildlife in America. Viking, NY. (p. 158)*

# BRISTLELESS DWARF SPIKE-RUSH AT THE QUILL LAKES: A THIRD CANADIAN RECORD

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The Bristleless Dwarf Spike-rush, *Eleocharis parvula* (Roem. & Schult.) Link var. *anachaeta* (Torr.) Svens.,* was until now recorded in Saskatchewan and in Canada from only Goose Lake south of Tessier and, coincidentally, Goose Lake near Webb (Figure 1).[5,7] Both finds were made by John H. Hudson. The first discovery was mistakenly reported as *E. parvula* var. *parvula*, which, except along the Pacific Coast from California to British Columbia, is found only in eastern parts of the continent, with no inland record in Prairie Canada or the United States Great Plains west of Missouri (V.L. Harms, pers. comm.).[5] This erroneous report was later corrected, and both records of Dwarf Spike-rush in Saskatchewan represent the bristle-less variety *anachaeta*.[7] The southern Saskatchewan records of this variety represent northern outliers peripheral to its overall North American range, which extends from North Dakota and Minnesota, south to Louisiana and Texas, and west to California and Oregon. It is particularly widely distributed along the coasts of the Gulf of Mexico and the Caribbean Sea but is rarely found inland, except perhaps in California.[9] Bristleless Dwarf Spike-rush has been listed as rare and threatened in Saskatchewan, nationally rare in Canada, and not at all in the floras of either Alberta or Manitoba.[1,2,6,8,10,11,12] Since Hudson's collections in 1977 and 1978, this easily overlooked species had been searched for in vain by various botanists and naturalists (V.L. Harms, pers. comm.).

Recently, however, while conducting field studies on shorebird food habits, I found stands of Bristleless Dwarf Spike-rush at three locations around the Quill Lakes: (1) extensive, dense stands along the east shore of Middle Quill (Mud) Lake; (2) a lush, dense stand in a borrow pit at the edge of the dyke in the northwest corner of Little Quill Restriction; (3) sparsely scattered, small patches along the west shore of Little Quill Lake (Figure 1). This plant probably also inhabited other basins in the vicinity of Little Quill Lake (Table 1). Voucher specimens from the first two locations are deposited in the W.P. Fraser Herbarium, University of Saskatchewan, Saskatoon (Voucher collections:

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* Some authorities argue that this variety should be regarded as a distinct species, *E. coloradoensis* (Britt.) Gilly.[3,8]

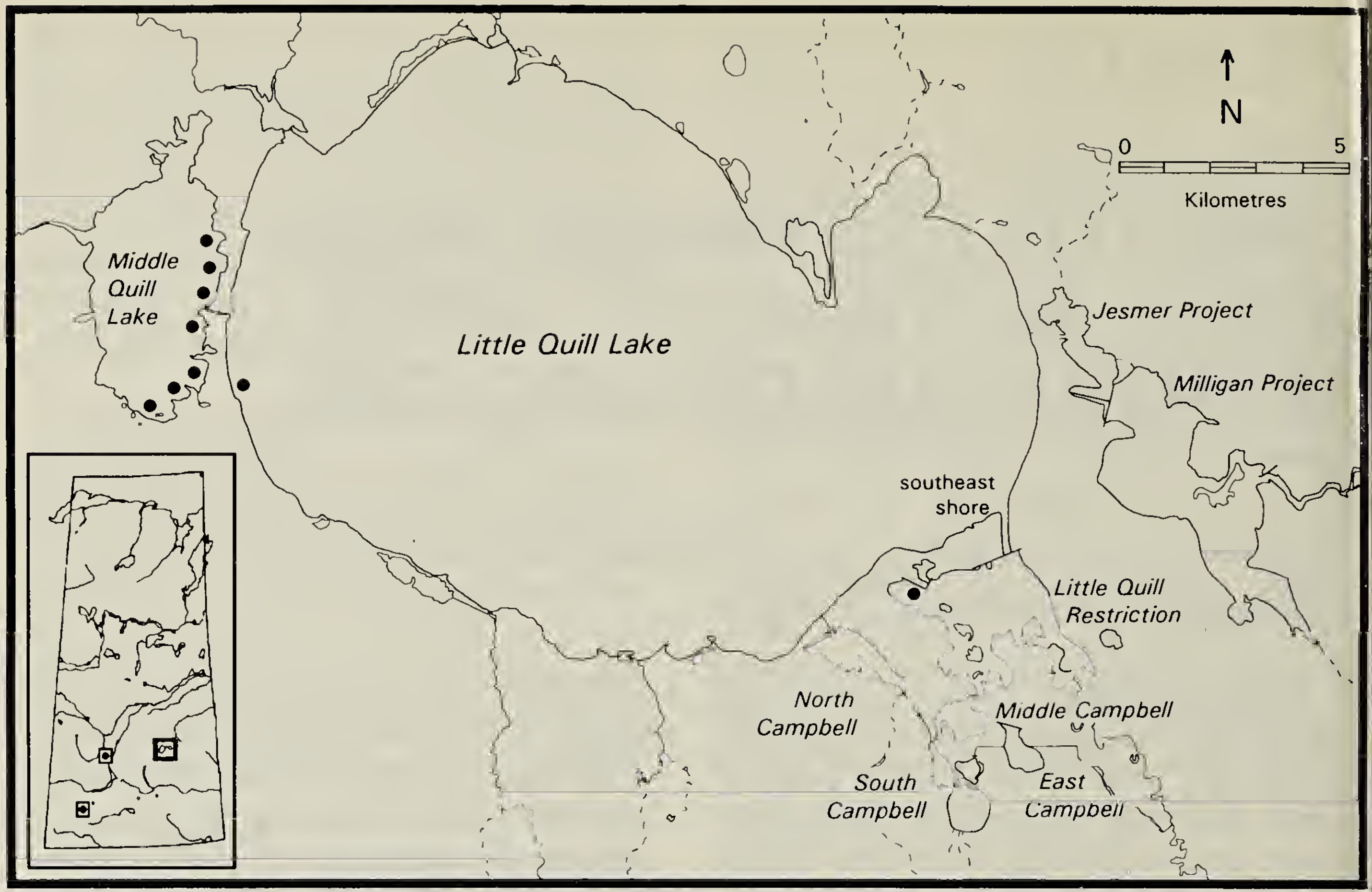

Figure 1. DISTRIBUTION OF BRISTLELESS DWARF SPIKE-RUSH IN SASKATCHEWAN AND AT THE QUILL LAKES. Previous reports are indicated by boxed dots on the inset map. Confirmed new locations are indicated by solid dots.

*Stuart Alexander, s.n., 10 September 1992, SASK Acc. nos. 107678 & 107679*).

Bristleless Dwarf Spike-rush is a short plant (1-7 cm tall), and may form dense, turf-like mats. It is easily mistaken for Needle Spike-rush, *E. acicularis* (L.) Roem. & Schult., which also occurs at the Quill Lakes. But unlike the latter plant, both varieties of Dwarf Spike-rush usually bear small tubers attached to stolons, which are readily identifiable in the field without magnification. At the Quill Lakes, tubers were present at least from early July to mid-September. Other species of *Eleocharis*, however, also bear tubers (e.g., *E. pauciflora* (Lightf.) Link). Positive identification requires examination of the achene.[9] Flowers bloom starting in late July and achenes mature in late August. Other characteristics for differentiating Dwarf Spike-rush from Needle Spike-rush are as follows: (1) former is annual rather than perennial, although also much tufted; (2) stylopodium (i.e., ovary-cap) is confluent with the achene summit, rather than separated from it by a constriction; (3) achene is greyish-brown and longitudinally fine-lined, rather than pearly-white and prominently ridged and cross-lined. In the variety *anachaeta*, perianth-bristles are absent or are three in number but greatly reduced, whereas in the variety *parvula*, perianth-bristles are six in number and at least as long as the achene.[9]

Dwarf Spike-rush resides on wet, saline mud flats associated with all types of water bodies from lakes to marshes. In July and August 1991, I

**Table 1. THE STATUS OF DWARF SPIKE-RUSH AND THE SALINITY AND pH IN BASINS AROUND LITTLE QUILL LAKE, SASKATCHEWAN**

| Location (substrate) | Status | Salinity 1991 | (g/L) 1992 | pH 1991 |
|---|---|---|---|---|
| Middle Quill Lake, east shore (clayey mud) | Present, abundant | 17.0 | 4.3-5.3 | 8.0 |
| Little Quill Lake, west shore (sandy mud) | Present, sparse | 9.2 | 7.9 | 8.5 |
| Little Quill Lake, southeast shore (sandy mud) | Probable, common | 7.4-10.3 | 7.2-8.7 | 8.5-9.2 |
| North Campbell (clayey mud) | Not checked | 5.1 | 4.5 | 8.8 |
| Middle Campbell (sandy mud) | Not present | 4.1 | — | 6.7 |
| East Campbell (mud) | Not present | 14.2 | — | 7.5 |
| South Campbell | Not checked | — | — | — |
| Little Quill Restriction (mud) | Probable, abundant | 4.2-6.0 | 1.5-2.2 | 8.6 |
| Little Quill Restriction borrow pit (mud) | Present, abundant | — | — | — |
| Jesmer Project (mud with plant debris) | Not present | 4.8 | — | 7.9 |
| Milligan Project (mud) | Not checked | 3.5 | — | 8.2 |

collected water samples from basins around Little Quill Lake and had them analyzed for conductivity, ionic composition (i.e., salinity), and pH at the University of Saskatchewan Soil Testing Laboratory. In 1992, I measured conductivity with a YSI handheld conductivity meter, and converted it to salinity using the relation between salinity and conductivity in the 1991 data (linear regression: $\log_{10}$[Salinity mg/L] = 1.258 $\log_{10}$[Conductivity mS/cm at 25°C] + 2.843; $r^2 = 0.99$, $n = 15$). The basins in which Bristleless Dwarf Spike-rush grew were mostly hyposaline (ionic salinity of 3-20 g/L)[4] and somewhat alkaline (Table 1).

Although not considered a submergent plant, much of the Dwarf Spike-rush at Middle Quill Lake in 1992 grew in water at least as deep as 0.5 m, particularly in July and early August. Water levels fluctuate considerably from year to year, and were relatively high in 1992. The submerged plants tended to be taller than exposed plants, but only the latter flowered. Submerged plants that became exposed as water levels at Middle Quill Lake dropped over the season also flowered. I noted a similar tuber-bearing species of *Eleocharis* submerged in the southwestern end of Little Quill Restriction (Figure 1), but water levels were high in 1992 and I could not find any specimens that were on exposed flats (except in the borrow pit, which is linked to Little Quill Restriction by a heavily vegetated marsh, and may best be considered distinct). These plants were probably also Bristleless Dwarf Spike-rush. In August and September, large quantities of submerged Spike-rush were uprooted by ducks feeding on Sago Pondweed (*Potamogeton pectinatus* L.) in both Little Quill Restriction and Middle Quill Lake.

In my studies on shorebird food habits at the Quill Lakes, I have found that

Spike-rush seeds are taken by Long-billed Dowitchers (*Limnodromus scolopaceus*) and Stilt Sandpipers (*Calidris himantopus*), and that the tubers from Dwarf Spike-rush are taken by Hudsonian Godwits although both items rarely and in very small quantities. In general, shorebirds ingest seeds either incidentally or as grit, and eventually regurgitate the seeds along with other indigestible items. Seeds often retain viability after being thus used. It is possible that Dwarf Spike-rush, a normally marine, coastal species, owes its presence inland to migrating shorebirds and waterfowl. Tubers, on the other hand, are readily digestible packets of carbohydrate. They are so small, however, that they seem hardly worthwhile food for birds as large as godwits, unless encountered in abundance, such as at Middle Quill Lake.

In summary, Dwarf Spike-rush is a rare plant in Canada, but can be locally abundant in saline habitats. It may be more common in the Prairie Provinces than is presently known. Interested naturalists should look for a small spike-rush bearing tubers, perhaps especially in areas frequented by large numbers of shorebirds and waterfowl during spring migration.

**Acknowledgements** Funding for shorebird research was provided by the Canadian Wildlife Service University Research Support Fund and, through the efforts of H. Loney Dickson, by the North American Waterfowl Management Plan. Vernon L. Harms and John H. Hudson confirmed the species identification and provided the variety classification. I would like to thank Vern Harms for encouraging this publication and for providing comments on the first draft, and Cheri L. Gratto-Trevor for reviewing the first draft.

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# CHECK-LIST OF SASKATCHEWAN MOTHS

# PART 11: PENMANS, ARCHES, ARMYWORMS, AND STYLUS MOTHS

RONALD R. HOOPER, Saskatchewan Museum of Natural History, 2340
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Abbreviations used: s = south, n = north, w = west, e = east, CNC = the only known Saskatchewan records of the species are in the Canadian National Collection in Ottawa. Unless otherwise indicated all the species are represented in the collection of the Saskatchewan Museum of Natural History, Regina. Species are listed according to R.W. Hodges's *Check List of Lepidoptera in North America North of Mexico.*

## Penmans, Polias, Armyworms, and Stylus Moths (*Hadeninae*)

Moths of this subfamily are readily distinguished from all other Owlet Moths (except *Pantheinae*) by the fact that they have hairy eyes. If you get a side view of the eyes with a 10x magnifying glass you can see long bristles sticking out all over their surfaces. The *Pantheinae* males normally have pectinate ("feathery") antennae.

Except for *Anarta*, our moths of the *Hadeninae* are non-conspicuously coloured in various shades of brown. This subfamily contains a number of pest species such as the Clover Cutworm, the Bertha Armyworm and the Armyworm.

The Variable Penman is one of our earliest spring moths, flying on April nights when it is scarcely above freezing.

The Little Hadena - *Hadenella pergentilis* (Grote). Swift Current (Department of Agriculture Collection in Saskatoon).

Clover Cutworm - *Discestra trifolii* (Hufn.) - s Sask., n to Red Earth.

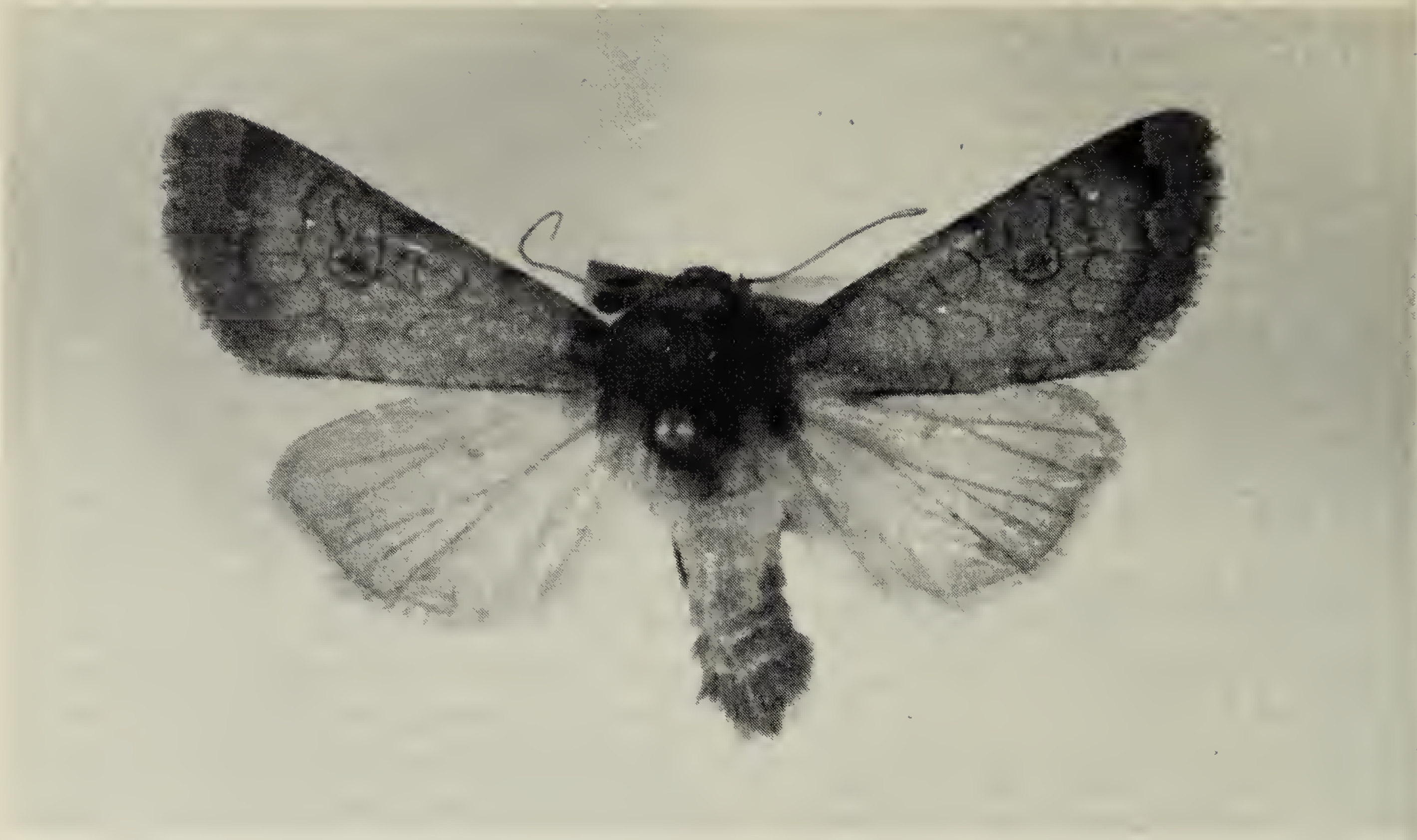
The Changeling - *Discestra mutata* (Dod) - s Sask., n to Aylsham.

Hamilton Discestra - *Discestra hamata* (McD.) - Cypress Hills (CNC).

The Oregonian - *Discestra oregonica* (Grt.) - Killdeer, Val Marie, and Cypress Hills.

Obese Discestra - *Discestra obesula* (Sm.) - Moose Mountain Provincial Park, Aylsham, and Saskatoon.

Farnham's Discestra - *Discestra farnhami* (Grt.) - s Sask., n to Love.



*Rosy Penman* (Sideridis rosea). *Keith Roney*

Crotch's Discestra - *Discestra crotchi* (Grt.) - Val Marie.

Chunka Cutworm - *Discestra chunka* (Sm.) - s Sask., n to Aylsham.

Fervid Scotogramma - *Scotogramma fervida* (B. and McD.) - Swift Current (CNC).

Added Scotogramma - *Scotogramma addenda* (B. and Benj.) - Killdeer and Val Marie.

Postica Penman - *Trichoclea postica* (Sm.) - Swift Current (CNC) and Roche Percee.

Brown and White Penman - *Trichoclea artesta* (Sm.) - Indian Head and Estuary.

Rosy Penman - *Sideridis rosea* (Harv.) - s Sask., n to Nipawin.

Ruby Penman - *Sideridis maryx* (Gn.) - Douglas Provincial Park, Christopher Lake, Cutknife, and Harlan (ne of Lloydminster).

Bertha Armyworm - *Mamestra configurata* (Wlk.) - s Sask., n to Shoal Lake, Red Earth, and Meadow Lake Provincial Park.

Large Grey Arches - *Polia discalis* (Grt.) - s Sask., n to Aylsham.

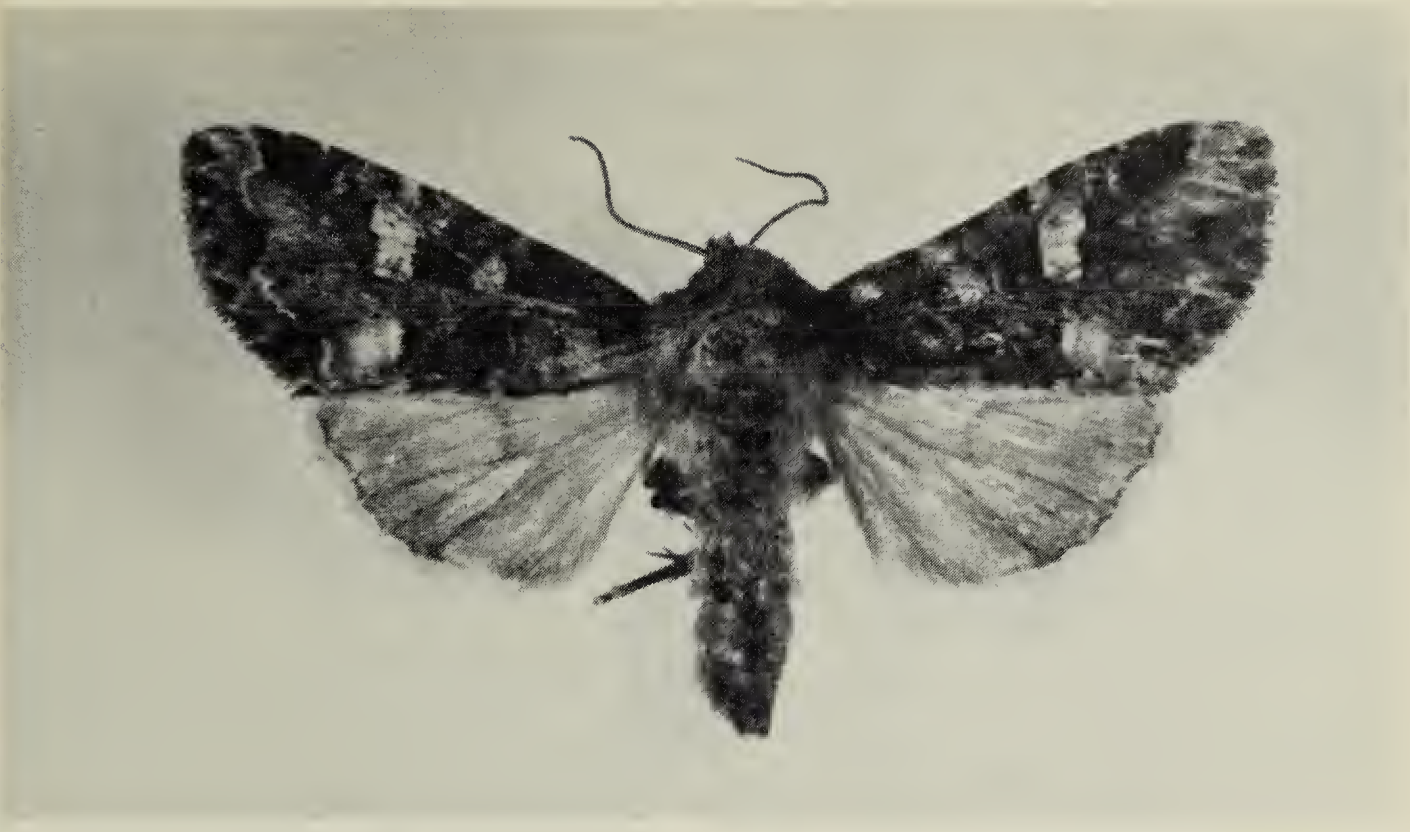
Mystic Arches - *Polia nimbosa mystica* (Sm.) - s Sask., n to Greenwater Provincial Park.

Cloudy Arches - *Polia imbrifera* (Gn.) - s Sask., n to Cumberland House and Buffalo Narrows.

Rogenhofer's Arches - *Polia rogenhoferi* (Moschi) - Wildcat Hill Wilderness Area. Also reported for Sask. by D. La Fontaine.

McCabe's Arches - *Polia propodea* (McCabe) - Wildcat Hill Wilderness Area.

Pale-tinted Arches - *Polia purpurissata* (Grt.) - s Sask., n to Nipawin Provincial Park and Gordon Lake (n of Pinehouse Lake).



*Darling Arches* (Lacanobia lutra). *Keith Roney*

Frivolous Arches - *Polia nugatis* (Sm.) - sw Sask., n to Fort Qu'Appelle, Beverley, and Tompkins.

Dingy Arches - *Polia detracta* (Wlk.) - s Sask., n to Sturgeon Landing.

Pointed Arches - *Polia goodelli* (Grt.) - s Sask., n to Love and Candle Lake.

Obscure Arches - *Polia obscura* (Sm.) - s Sask., n to Red Earth and Meadow Lake Provincial Park.

White-spotted Arches - *Melanchra adjuncta* (Gn.) - s Sask., n to Wildcat Hill Wilderness Area and Aylsham.

Painted Arches - *Melanchra picta* (Harr.) - s Sask., n to Shoal Lake.

Powdered Arches - *Melanchra pulverulenta* (Sm.) - Wildcat Hill Wilderness Area, Greenbush campsite (w of Hudson Bay), Waskesiu area, and Cypress Hills.

Black Arches - *Melanchra assimilis* (Morr.) - central Sask., n to Shoal Lake, s to Lestock and Saskatoon.

Nevada Arches - *Lacanobia nevadae* (Grt.) - Duck Mountain Provincial Park and Somme.

Atlanta Arches - *Lacanobia atlantica* (Grt.) - s Sask., n to Cumberland House and Meadow Lake Provincial Park.

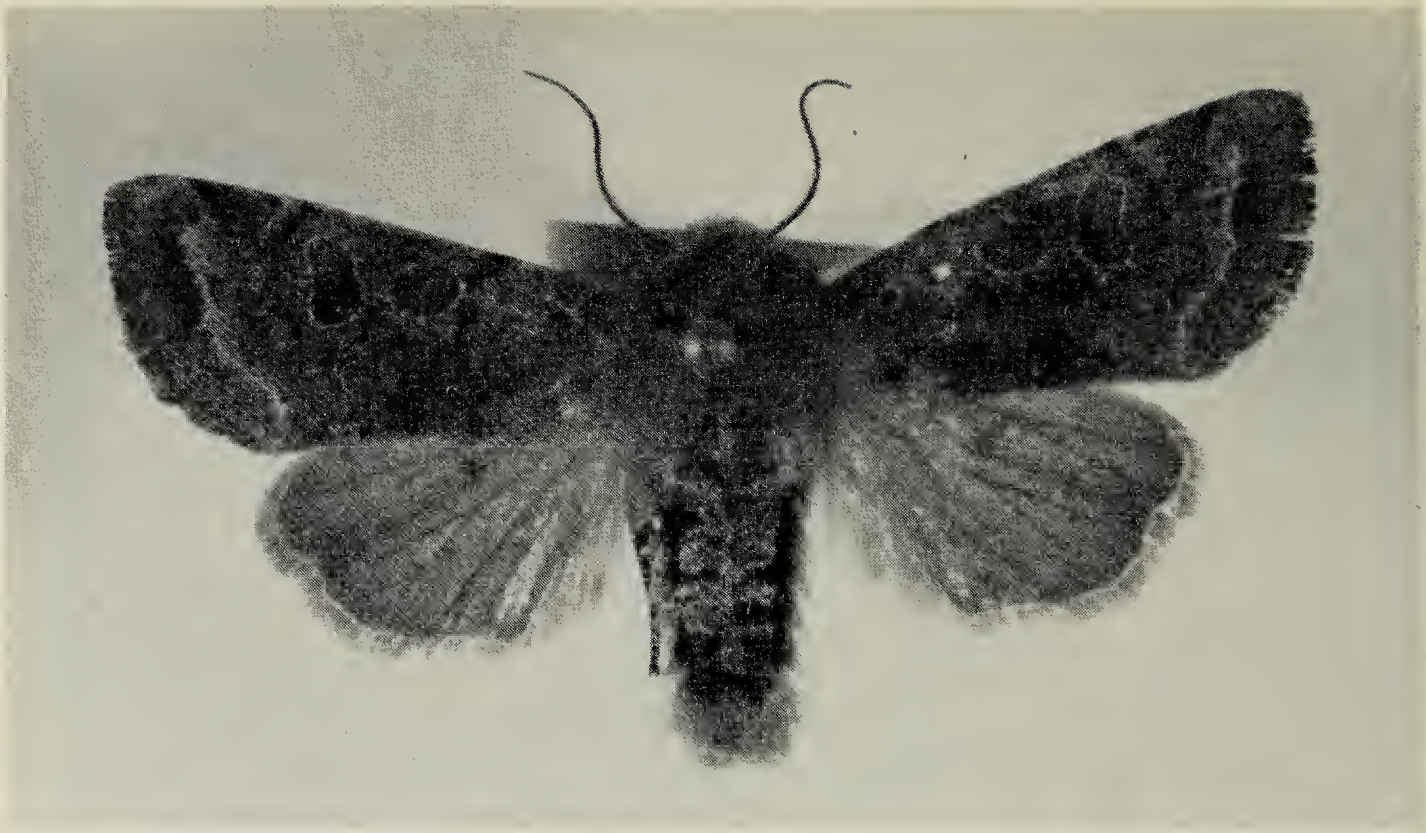
Garden Arches - *Lacanobia radix* (Wlk.) - s Sask., n to Sturgeon Landing and Clearwater River campsite.

Harnessed Arches - *Lacanobia subjuncta* (G. & R.) - s Sask., n to Love.

Pale-banded Arches - *Lacanobia grandis* (Gn.) - Tantallon, Crooked Lake, Kamsack, and Rosefield (se of Val Marie).

Darling Arches - *Lacanobia lutra* (Gn.) - s Sask., n to Shoal Lake and Harlan (ne of Lloydminster).

Tacoma Arches - *Lacanobia tacoma* - (Stkr.) - s Sask., n to Aylsham and Lashburn.



*Variable Penman* (Osthosia hibisci). *Keith Roney*

Striped Garden Catarpillar - *Lacanobia legitima* (Grt.) - Lestock and Tompkins.

Dod's Arches - *Lacanobia dodii* (Sm.) - s Sask., n to Aylsham, Prince Albert and Onion Lake.

Lilac Arches - *Lacanobia lilacina* (Harv.) - s Sask., n to Carrot River.

Liquid Arches - *Lacanobia liquida* (Grt.) - s Sask., n to Shoal Lake and Onion Lake.

Quadrate Arches - *Papestra quadrata ingravis* (Sm.) - s Sask., n to Somme and Ile-a-la-Crosse.

Crested Arches - *Papestra cristifera* (Wlk.) - Kamsack and Wildcat Hill Wilderness Area.

Anarta Mimic - *Anartomima secedens* (Wlk.) - Harlan (ne of Lloydminster) (CNC) and Wildcat Hill Wilderness Area.

Prairie Capsule Moth - *Anepia circumvadis* (Sm.) - s Sask., n to Saskatoon and Cutknife.

The Cobbler - *Hecatera sutrina* (Grt.) - Weekes, Somme, Saskatoon and Glentworth.

Canadian Catocaline Anarta - *Anarta cordigera* (Thunb.) - n Sask., s to Greenbush campsite (w of Hudson Bay) and Prince Albert.

Seal - *Lasiestra* sp. - Hasbala Lake.

Seal - *Lasionycta* sp. - Patterson Lake (w of Hasbala Lake).

The Thinker - *Lacinipolia meditata* (Grt.) - s Sask., n to Shoal Lake and Prince Albert.

Lustrous Arches - *Lacinipolia lustralis* (Grt.) - s Sask., n to Shoal Lake, Love, Prince Albert, and Loon Lake.

Snaky Arches - *Lacinipolia anguina* (Grt.) - s Sask., n to Aylsham and Ile-a-la-Crosse.

Longiclava Arches - *Lacinipolia longiclava* (Sm.) - reported for Sask. by H. Mcdonald.

Small Grey Arches - *Lacinipolia vicina* (Grt.) - s Sask., n to Nipawin Provincial Park.

Kidney-spotted Arches - *Lacinipolia renigera* (Steph.) - s Sask., n to Pelican Narrows, La Ronge, and Buffalo Narrows.

Bridled Arches - *Lacinipolia lorea* (Gn.) - s Sask., n to Cumberland House, Candle Lake, and Loon Lake.

Olive Arches - *Lacinipolia olivacea* (Morr.) - s Sask., n to Creighton.

The Girdler - Dargida procincta (Grt.) - s Sask., n to Bjorkdale and Saskatoon.

Wheat-Head Armyworm - *Faronta diffusa* (Wlk.) - s Sask., n to Carrot River and Buffalo Narrows.

Lesser Wainscot - *Aletia oxygala* (Grt.) - throughout Sask.

Armyworm - *Pseudaletia unipuncta* (Haw.) - s Sask., n to Shoal Lake and La Ronge.

Anteoclara Wainscot - *Leucania anteoclara* (Sm.) - Fort Qu'Appelle, Saskatchewan Landing Provincial Park, Piapot, and Cypress Hills.

Phragmites Wainscot - Leucania phragmatidicola (Gn.) - Halbrite.

Many-lined Wainscot - Leucania multilinea (Wlk.) - s Sask., n to Aylsham.

Comma Wainscot - *Leucania commoides* (Gn.) - s Sask., n to Aylsham.

Heterodox Wainscot - *Leucania insueta* (Gn.) - throughout Sask.

Grey Spectacles - *Stretchia plusiaeformis* (Hy.Edw.) - s Sask., n to Aylsham.

Beautiful Penman - *Orthosia revicta* (Morr.) - s Sask., n to Otter Rapids.

Segregate Penman - *Orthosia segregata* (Sm.) - s Sask., n to Bainbridge campsite (n of Hudson Bay).

Variable Penman - *Orthosia hibisci* (Gn.) - s Sask., n to La Ronge area.

Norman's Quaker - *Crocigrapha normani* (Grt.) - s Sask., n to Cumberland House.

Curialis Woodling - *Egira curialis* (Grt.) - Swift Current (CNC).

Grieving Woodling - *Egira dolosa* (Grt.) - s Sask., n to Kinoosao area.

Ruddy Woodling - *Egira rubrica* (Harv.) - Rosefield (se of Val Marie) and Estuary.

Bicolored Woodling - *Morrisonia evicta* (Grt.) - Fort Qu'Appelle.

White-lined American - *Tholera americana* (Sm.) - Stoughton, Saskatoon, and Swift Current (CNC).

Shaded Umber - *Nephelodes minians* (Gn.) - s Sask., n to Shoal Lake and La Ronge.

Brown Stylus - *Anhimella contrahens* (Wlk.) - s Sask., n to Somme and Saskatoon.

Scurfy Quaker - *Homorthodes furfurata* (Grt.) - s Sask., n to Aylsham and Loon Lake.

Utah Quaker - *Protorthodes utahensis* (Sm.) - Mortlach.

Island Stylus - *Protorthodes oviduca* (Gn.) - throughout Sask.

Orbiculate Stylus - *Ulolonche orbicu-*

*lata* (Sm.) - Rosefield (se of Val Marie), Val Marie, Piapot, and Cutknife.

Rustic Quaker - *Orthodes crenulata* (Butler) - Tantallon.

Cynical Quaker - *Orthodes cynica* (Gn.) - se Sask., n to Wildcat Hill Wilderness Area and w to Pike Lake.

## Expected Species

Antica Penman - *Trichoclea antica* (Sm.) - n to Malta, Montana.

Eastern Armyworm - *Mamestra curialis* (Sm.) - from Quebec w to Edmonton, Alberta.

Capsule Moth - *Anepia capsularis* (Gn.) - e Canada, w to Aweme, Manitoba.

Brown Spectacles - *Stretchia muricina* (Grt.) - British Columbia e to Medicine Hat, Alberta.

Western Penman - *Orthosia pacifica* (Harv.) - British Columbia e to Winnipeg, Manitoba.

Distinct Quaker - *Achatia distincta* Hbn. - e Canada, w to Cartwright, Manitoba.

Dingy Stylus - *Protorthodes curtica* (Sm.) - British Columbia e to Manyberries, Alberta.

Akalus Stylus - *Protorthodes akalus* (Stkr.) - Montana, n to Dinosaur Park, Alberta.

Small Brown Quaker - *Pseudorthodes vecors* (Gn.) - Newfoundland w to Cartwright, Manitoba.

Signate Quaker - *Tricholita signata* (Wlk.) - Nova Scotia w to Cartwright, Manitoba.

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# FLICKER EXPLOITS HORNET AND WASP NESTS IN WINTER

FRANK H. BRAZIER, 2657 Cameron St., Regina, Saskatchewan. S4T 2W5

In the autumn of 1982 about 3m up in the old rowan tree in our front yard I noticed a nest of the insect popularly known as the Bald-faced Hornet. I had occasionally seen them drinking at the birdbath underneath that tree. Somewhat earlier I had discovered the nest of the yellowjacket or wasp concealed in the dense foliage of an old honeysuckle bush at the southwest corner of our home. As we faced west we had a good view through out picture window of most of the front yard.

December 2, 1982, was a cool day, windy, with some snow. I was home about 11:00 a.m. looking out of the window when I noticed debris from the hornet nest drifting past to the south. I went out and saw a male Northern Flicker working on the nest. He had worked on it until the cells were exposed. Then he positioned himself just below it on a convenient branch and systematically plundered the cells. I saw an occasional hornet in his bill before it was swallowed. Finally he flew off to a nearby ash tree and clung to the trunk on the lee side, out of the wind. He rested there for about 20 minutes but when I looked later he had gone. The wasp nest had been damaged but was still largely intact.

I did not see the Flicker again until December 23 but he must have been back at intervals because the hornet nest had been completely destroyed. On that day, he returned in the afternoon and attacked the wasp nest but was soon disturbed and flew off. He was back again about 12:30 p.m. on December 28, attacking the wasp nest; he left after making considerable inroads on the structure. He was back the next day at 11:00 a.m. and again at 3:00 p.m. when he finished it off. He visited the wasp nest remains briefly on January 2, 1983. I thought he was gone for good and, so, was surprised to see him again at 1:00 p.m. on February 7, 1983, working over the nest remains, both on the ground and in the bush, for nearly an hour. I never saw him again.

About two years ago I had occasion to consult Keith Roney, entomologist of the Saskatchewan Museum of Natural History, about wasps. He told me that our wasps and hornets, which are closely related, do not stop reproducing in the fall but continue until cold weather kills every insect in the nest. The mated queens hibernate elsewhere, in holes in the ground or under leaf litter, until spring when the cycle begins anew.

I was told that five species of wasps and two species of hornets occur here, so, without actual specimens it was not possible to give their scientific names. To the average person "yellowjacket" and "wasp" are the same; "Bald-faced Hornet" (or sometimes "White-faced Hornet") is the official common name of both hornets that are here and when close enough to see details the hornet is obviously not a yellowjacket.

Both hornets and wasps start their nests at the top, constructing new layers as they go down, so the insects at the top are the farthest advanced and the lower tiers contain pupae and eggs of different ages. The nests of both the hornet and the wasp that I had in my front yard were similar, each about 15 cm diameter at the widest near the top, and roughly oval in shape.

As an appropriate footnote I would add that in the winters of 1957, 1958 and 1959, Elmer Fox, his son Reg and I walked from Bredin Siding along the valley of Boggy Creek to Lumsden, as part of the Christmas Bird Count, and on occasion we saw magpies plundering the wasp or hornet nests that had been constructed in low bushes.

## NOTICE

# WANTED: BIRD RECORDS FOR YUKON TERRITORY

The Canadian Wildlife Service is compiling a database of current and historical bird records for Yukon Territory. The database will be used to produce a publication called *Birds of the Yukon*, which will include species accounts and grid-style distribution maps for all Yukon species.

If you have visited the Yukon and kept bird notes, please send a copy of your notes to Pam Sinclair, Canadian Wildlife Service, Box 6010, Whitehorse, Yukon, Y1A 5L7. Fairly exact locations of sightings are essential for mapping, which will be based on 1:50,000 scale NTS map sheets. In addition, any evidence of breeding (nests found, adults feeding young, young-of-the-year observed, etc.) would be very useful. All contributions will be acknowledged in the publication.

# POSSIBLE HYBRIDIZATION BETWEEN BLUE JAYS AND STELLER'S JAYS

GERRY WILDE, 276 Collinge Road, Hinton, Alberta. T7V 1L3

Steller's Jays and Blue Jays in the Hinton area are at or beyond the limits of their respective ranges. However, in the past two years both have become fairly common visitors at my backyard bird feeder. Groups of jays are uncommon here because of their low numbers, particularly Steller's Jays.

In the spring of 1992, I was surprised to notice that a Blue Jay and a Steller's Jay were sharing the feeder. Usually Steller's Jays and Blue Jays show considerable aggression, particularly at the feeders, with the Steller's Jay being the dominant bird. I forgot about this until early in the first week of August when I again noticed Blue Jays and a Steller's Jay sharing the feeder. Upon closer examination I noted that there was one Steller's Jay and six Blue Jays of which five appeared to be young.

While observing these birds and their behaviour around the feeder I became convinced that I was watching a family of which a normal Blue Jay was the female, the Steller's Jay was the male and the young were hybrids. The young, which were easily recognized by their short tails, were in appearance very much like Blue Jays, except that they were very dark in colour. This darkness was apparent throughout the entire bird, with the blue areas being dark blue and the black areas wider and very black. The Blue Jay was a light-coloured bird, which is typical for this area. It would call the young and assist them with their feeding. The Steller's Jay, although close by and obviously part of the group, did not appear to feed the young. This bird seemed to be a typical Steller's Jay, with normal coloration except for a small round white spot above the eye. I observed their family-like activities for approximately 10 days and after this period of time they gradually became less and less of a family unit. As of August 21 they still regularly visited the feeders, although they did not arrive as a family unit, but as individual birds.

The calls of the three types of birds appeared to be different with the Blue Jay and the Steller's Jay uttering normal calls. The young birds made a variety of calls, which did not resemble either of the two species' calls. These calls may or may not be typical of young Blue Jays, because they are not a common nester in this area, and I am not familiar with the call of young Blue Jays.

A quick review of the available literature presented no recognition of hybridization between these two species, although a colleague of mine indicated that hybridization was suspected between these two species in the United States. An interesting note is that the Hinton area is the most likely area in Canada of range overlap between these two species and that hybridization in other areas is most unlikely.

# LITTLE GULL SIGHTED AT BUFFALO LAKE, ALBERTA

J. PAUL GOOSSEN, Canadian Wildlife Service, Room 210, 4999-98 Avenue, Edmonton, Alberta. T6B 2X3

On 25 May 1992, I observed a Little Gull flying along a peninsula at Buffalo Lake in central Alberta. I estimate I had seen over 800 Franklin's Gulls in the peninsula area, when I heard a strange call above me. I looked up and saw an unfamiliar gull which was smaller than and different in plumage from the Franklin's. As the adult gull flew eastward along the peninsula, I noted it had a black head, red legs, white abdomen, black underwings and gray-white upper wings. I saw no black markings on the upper wing. The gull soon landed on the peninsula where I briefly observed it through a 15-45x spotting scope. I noted that the black on the head extended down to its nape and its bill was black or black-red. I later consulted a field guide and concluded my observations matched no other gull than the Little Gull. Unfortunately, I cannot verify this sighting with a photograph.

The Little Gull, a Eurasian species, was first documented breeding in North America (in southern Ontario) during 1962.[4] It has since been found breeding in northern Ontario, Quebec, northern Manitoba, Wisconsin, Michigan[4] and Minnesota.[9] In Alberta, the Little Gull is considered to be a vagrant or wanderer.[3] The bird I observed at Buffalo Lake is Alberta's seventh known Little Gull. The first confirmed record was of two individuals at Namaka Lake in 1985.[5,8] Sightings of a single bird at Namaka Lake two days after the initial sighting and of two birds at nearby Eagle Lake a week later (J.B. Steeves pers. comm.) were probably the same birds. Another Little Gull was seen at Namaka Lake in 1988.[1] Single individuals were also seen at Beaverhill Lake (1986),[6] near Cooking Lake (1988)[10,11] and the Glenmore Reservoir in Calgary (1991).[2,7]

The Little Gull seen at Buffalo Lake is of interest not only as a first sight record for this lake but also because it appeared in southern parts of the Prairie Provinces. The Little Gull occurs less frequently in spring than in fall.[10]

**Acknowledgements** I thank Neville Sproule for land access permission, John B. Steeves for sending me information on sightings and Valorie Goossen for helpful editorial comments.

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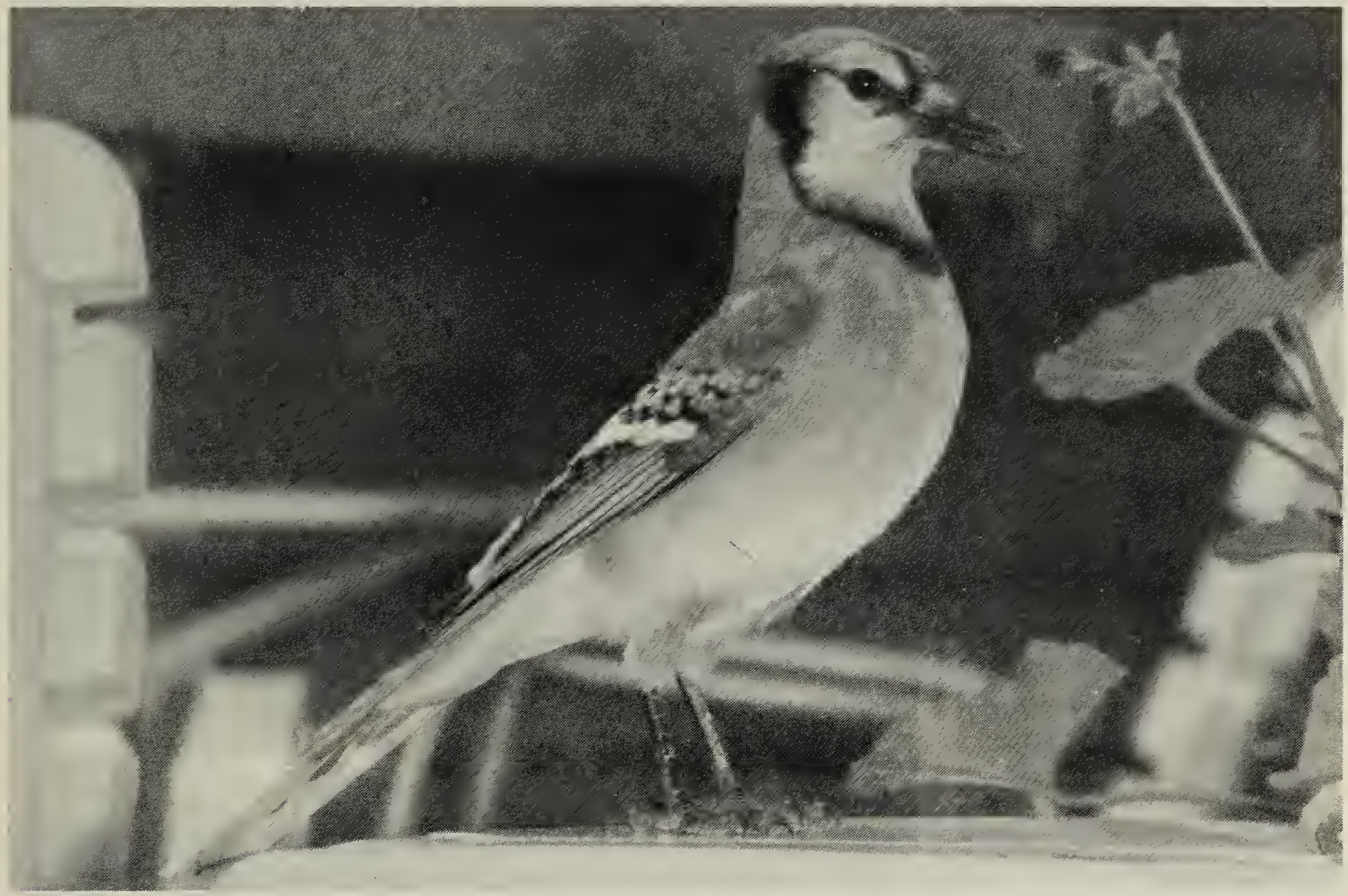
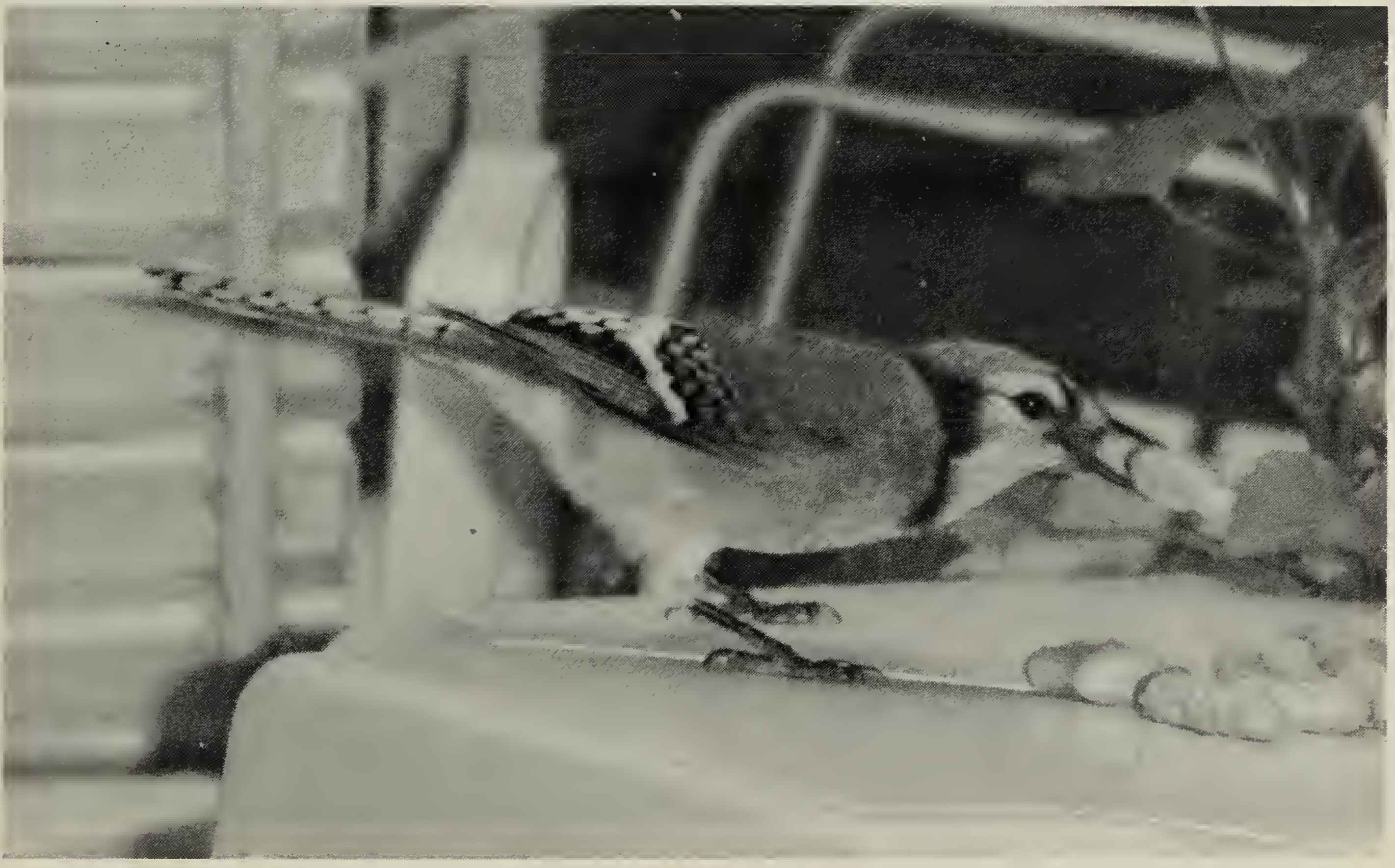
# THOUGHTS OF A PERCEPTIVE BLUE JAY

Photos by DOUGLAS A. SCHMEISER, College of Law, Sub Post Office 6,
University of Saskatchewan, Saskatoon, Saskatchewan. S7N 0W0



*Well! Well! Well!*



*Umm! Umm! Good!*

*Deeee-lec-table!*

*Just green seedless? No way!*

# THE WINTERING MERLINS OF SASKATOON

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Traditionally, Merlins which breed in the northern Great Plains of North America (Richardson's Merlin, *F. c. richardsonii*) are migratory. Each fall, after completion of breeding, they migrate from this area to the south-central United States and northern Mexico. The establishment of urban-based Merlin populations, and the occurrence of some individuals from these populations remaining in the cities through the winter period (November through February), are recent phenomena. Although William Rowan (University of Alberta Archives) reported Merlins during the winter in Edmonton as early as 1922, there were no other reports of wintering birds on the Prairies until 1948.[11] Since that time however, wintering populations have developed in all major Canadian prairie cities, and many of the smaller urban centres. The establishment and growth of these populations is evident from analyses of the numbers of Merlins seen on annual Christmas Bird Counts (CBC's). The analyses indicate that in four major cities of the Canadian Great Plains (Edmonton and Calgary, Alberta, and Regina and Saskatoon, Saskatchewan) significant increases in the number of Merlins on CBC's occurred during the period from 1957 to 1983.[5] In contrast, the numbers of Merlins on CBC's in U.S. centres of the Great Plains region (considered more within the traditional winter range of Richardson's Merlin) remained steady over the same period. This suggests a northward expansion of the wintering range of Merlins to include these new wintering grounds, and a growing use of these areas which has continued to increase through to present. In Saskatoon, a substantial population of wintering Merlins was not established until the mid- to late 1960s, but since that time the population has greatly expanded.[15]

Along with the development of wintering populations in the cities of the northern Great Plains has come the establishment of breeding populations of Merlins in the same urban centres. Merlins wintered for a decade or more in communities across the prairies before they started breeding. In fact, the initial breeding colonization of towns and cities may have been made easier for Merlins by their habituation to people, gained while spending their winters in these urban centres. The best documentation of breeding population growth in an urban centre over time comes from a detailed study of the Saskatoon Merlin population, which has been monitored since its initiation in 1971. Each year the city has been searched to locate all Merlin pairs and to band both the chicks and breeding adults. In the 20 years since that first nest in 1971, the population grew to a high of 31 successfully breeding pairs. With a substantial winter population, Saskatoon proved to be an ideal location to study this unusual phenomenon.

The primary question is, "Why

*Merlin with prey.* *Ian G. Warkentin*

would a Merlin dramatically alter its behaviour from a strictly migratory to a non-migratory strategy?" - particularly when such a change means remaining through the winter in an urban centre where the climate can become quite harsh and potentially life-threatening if the proper resources are not available. While a precise answer to this question is elusive, the results of five winters (1983-84 through 1987-88) spent examining the Merlin population of Saskatoon may provide some clues as to what triggered the development of this new behaviour pattern in so many individuals. I believe that the key to understanding this phenomenon lies within the phrase above referring to the availability of appropriate resources.

## Prey Availability and Winter Diet

Obviously, because of their relative abilities to store energy for both short-term and long-term use, the consistency of food availability is more critical to small than to large birds. Species such as the Bald Eagle wintering in this region are able to consume great quantities of food at one time and store large amounts of energy as fats which can be drawn upon for periods up to several weeks, if necessary, to survive through prolonged bad weather or food shortages. In contrast, smaller species such as the Black-capped Chickadee wintering in the same area are unable to store large quantities of energy and in extreme cold may survive only a day or two if unable to forage due to inclement weather. For a relatively large-bodied bird such as the Merlin, consistency of food supply is not as critical; fat reserves could allow a Merlin in good condition to survive without feeding for four or five days in winter (pers. obs.). Thus, Merlins are well able to withstand periodic short-term food shortage (although shortages may be more serious in the long term).

One of the most important requirements for birds existing in cold climates, however, is abundant and

*Saskatoon Merlin on winter perch.* *Lynn W. Oliphant*

accessible food. Previous analyses of CBC's over a 27-year period found a positive correlation between the rise in Merlin numbers in the major cities of the northern Great Plains and increases in the numbers of Bohemian Waxwings seen.[5] Although cause and effect cannot be separated in this type of statistical examination and a direct link between the two cannot be assumed, there is other evidence to support this link. During my study, waxwings were the prey being consumed on 23 of 133 (17%) occasions when I encountered feeding Merlins. This translates to about 26% of the Merlin diet (by weight) when consideration is given to the sizes of all prey eaten during my observations. With over a quarter of the diet consisting of waxwings, there is the possibility of a link between increased numbers of waxwings in cities and increased Merlin populations. It is necessary to assume also that the diet of a typical Merlin has remained relatively unchanged since they first began wintering in Saskatoon.

By far the predominant prey of Merlins in Saskatoon in winter is the House Sparrow. This species constituted 96 of 133 (72%) prey observed, or an estimated 66% of the diet by weight. These values are consistent with those found for the diet of Merlins breeding in Saskatoon in which House Sparrows comprised 64%[9] and 67% (N. Sodhi, pers. comm.) of all prey individuals and 76% of prey at Merlin nests in Edmonton.[4] Unlike the increasing numbers of waxwings seen over the years, the numbers of House Sparrows (seen on CBC's) showed no significant increase in the cities of the northern Great Plains during the period from 1957 to 1983.[5] Given the large numbers of House Sparrows found in most of these cities, their high populations may be one reason for the initial attraction of Merlins to the city, although this may not explain the increase in Merlin populations over time.

With conservative estimates putting the number of House Sparrows in Saskatoon in the tens of thousands each winter, and varying (but apparently increasing) numbers of Bohemian Waxwings, food for Merlins is abundant. However, prey must also be obtainable. Are those birds which spend the winter in Saskatoon able to capture prey in winter with similar efficiency to that of other Merlin populations? Only three other studies of wintering Merlins are available for comparison with my data. In California, a female Merlin was successful on 13% of 343 attempts to capture prey.[10] Merlins hunting on estuaries in Washington, also on the Pacific coast, were successful in 22% of 111 attempts, and Merlins wintering in West Galloway, U.K., were successful on 10% of 114 attempts.[1,2] Through the use of tail-mounted radio transmitters, I observed Merlins in Saskatoon make 789 hunting attempts resulting in 102 kills (13% hunting success). Because this observation technique tends to favour the confirmation of kills and underestimate hunting attempts, this success rate may be biased upwards slightly, but it is certainly well within the range of what might be expected from the results of the other studies. Prey are imposing similar food constraints, through obtainability, on Merlins throughout their wintering range.

Another way to approach the question of prey abundance is to look at the energetic requirements of an individual. How much food (and thus how much energy) is needed to maintain bodily functions, body temperature, plus the costs of activities such as perching, flying, preening, eating and others? Using a technique called open-circuit respirometry, I measured the energetic costs of these factors in captive Merlins to develop daily energy budgets.[17] Taking into account average weather conditions during winter in Saskatoon, and how this influences the amount of energy required to maintain body temperature, I translated all of these costs into the number of prey needed by each individual Merlin to survive the winter in the wild. I then extrapolated from this value to determine what would be needed for the population as a whole. Each Merlin requires nearly 200 House Sparrow-sized birds for the period from November through February. Based on a maximum population estimate obtained during this study of 38 Merlins present one winter, the overall consumption by Merlins in Saskatoon for the winter period would be 200 kg or nearly 7600 House Sparrow-sized prey. This figure is well below estimates of the potential prey population, indicating a more than sufficient food base for Merlins in Saskatoon.

**Roost Availability** In addition to a reliable food supply, wintering birds in harsh climates require suitable nighttime roost sites. Mills suggests that the winter range of the American Kestrel expanded in the Ohio River valley due to the construction, and later abandonment, of large wooden barns.[7] These structures provided an abundance of sheltered roost sites enabling better winter survival in this region. Likewise, Merlins wintering in the cities of the northern Great Plains region require adequate protection from the elements at night roosts. This was not available until coniferous trees were planted and had grown large enough to provide sufficient shelter.

Along with providing cover overhead which limits the amount of body heat lost to the night sky, wind reduction makes roost availability an additional important factor to wintering birds. Other studies have shown that the energy savings for a bird in a protected roost are in the 5-10% range; that is, for each night when they use a protected roost, birds expend 5-10% less energy than birds roosting on an open (unprotected) perch.[12,18] In this study, I found that Merlins which use protected night-time roosts saved about 6% of their daily energy budget compared with the theoretical costs of a bird roosting in the open, and most of this saving was due to sheltering from the wind.[17] This could be seen in the behaviour of Merlins entering a roost tree: once perched on the selected tree, they slowly hopped from branch to branch around the tree near the trunk, finally settling on a lee-side branch, out of the wind and right next to the trunk. A brief study of the wind in and around four roosts revealed that the average wind reduction in the roost positions chosen was about 71%.

All of the Merlin roosts discovered in Saskatoon were in coniferous trees, either White or Blue Spruce. Generally, they were found along residential streets or in backyards. Some were in parks, cemeteries and schoolyards. Various characteristics of these roost trees and the areas immediately surrounding them were compared with those same features in a sample of trees chosen at random from across the city. The characteristics of the area immediately surrounding the roost (such as the proximity of the nearest house, distance to the nearest available open perch or utility pole, distance to the nearest road, etc.) apparently had little influence on the selection of a particular tree. Analyses suggested that the features of the tree itself, particularly size, were most important to the Merlins. One Merlin roosted in a tree which was only 7 m tall, but the average roost tree was significantly taller than what was generally available in the city (14.3 m for selected trees versus an average tree height among the random sample of 11.3 m). The importance of tree size for a Merlin roost relates back to the amount of shelter from the wind a tree will provide to a roosting Merlin. A larger tree has more branches and needles to block the wind giving better protection to a Merlin than it would receive if perched in a smaller tree, or on an open perch such as a deciduous tree or power pole.

Both suitable roost sites and the availability of food were therefore probably essential components in the establishment of wintering Merlin populations in Saskatoon and other cities across the Prairies. But it is difficult to separate these two factors, or rank them in importance. In fact, there were likely conifers which would have been large enough to be suitable as roost sites many years before Merlins began to winter here. Likewise, a substantial House Sparrow population was present long before the establishment of a winter Merlin population. It is also unlikely that Merlins were initially attracted to the cities by the appearance of waxwings, since migratory Merlins leave the area long before the Bohemian Waxwings arrive from the north. These points do not address the question as to why these populations came about.

In all likelihood, chance and a strategy which proved to be successful played a large part in the development of Merlin populations across the northern Great Plains. Whether late migrating Merlins were "trapped" by early winter storms which then made it impossible to continue migrating south; or, as is more likely, birds migrating along the river systems of the Prairies (which are part of their traditional habitat) encountered the above features in the cities, stayed for the winter and were successful, the strategy is now well established. There are at least two factors which would favour this new behaviour pattern. It would appear that it is better, if possible, to avoid the heavy energetic costs and potential dangers of migration such as human and other predators, hunting in unfamiliar terrain which presumably makes it more difficult, and increases both the chance of starvation as well as that of injuries such as flying into power lines (particularly among inexperienced birds). Remaining on, or near, the breeding grounds is also advantageous because it could lead to nonmigrant birds obtaining better nest sites (territories), and/or better quality mates by being the first ones there in spring. Despite the potential advantages to nonmigratory birds, these benefits must be weighed against the costs of surviving harsh and potentially life-threatening winters at northern latitudes.

**Composition of Wintering Population** Although the data are insufficient to examine differences in survivorship between migrant and nonmigrant birds, in this section I will look at another aspect of fitness and compare the productivity of birds in these two groups. When this project began in 1983, one of my first questions was, "Who are the birds wintering here, and what, if any, is their relationship to the breeding population?" There are several possible origins for the birds now wintering in Saskatoon. They could have been Richardson's Merlins breeding further north in the parkland region of the province, or in the countryside adjacent to Saskatoon. Another possibility was that they were the birds from the boreal forests of northern Saskatchewan (the subspecies *F. c. columbarius*), which stopped in the city on their way south and remained. By the time I started my study, they could also have been birds from the Saskatoon breeding population, or a combination of these groups. Because of the extensive program of banding Merlins in Saskatoon which has been going on since 1971, I was able to address this question directly. While it is possible that some birds are entering from the surrounding countryside for the winter, none of the birds seen during the five winters of this study were of the darker (boreal) *columbarius* subspecies. In fact, of 303 sightings where both legs of the birds could be seen, only 4 were confirmed to be unbanded. Because there are no other large-scale Merlin banding programs currently operating around Saskatoon, this means that in excess of 98% of the wintering Merlin population were hatched in the city, or had been banded as a breeding adult in Saskatoon.

By trapping individuals each winter, I also obtained a precise picture of the composition and size of the wintering population in terms of sex and age.[15] I found that males and females were equally represented among the birds trapped. However, the distribution of ages within the sexes differed significantly. I found that most (90%) of the 32 males caught in winter were less than four years old, and the majority (53%) of 23 females were four years or older. The presence of relatively fewer younger females may reflect a lower survival rate among yearling females (birds hatched the preceding summer) in the harsh winter climate of Saskatoon. The yearling females caught in winter were much lighter than expected. On average they were 42 g less than wintering adult females (two+ years old) and 20 g less than the average of yearling females breeding in their first summer. For all other age/sex groups (i. e., yearling males, and adult males and females) average winter masses of nonmigrants were greater than their summer counterparts by 5-10%. This suggested that yearling females wintering in Saskatoon were in much poorer condition and less likely to survive. This may be related to the slower development of hunting skills in yearling females which could make it more difficult for them to survive winters at northern latitudes than males.

The predominance among males of younger birds is interesting, since few of these birds (especially yearlings and two year olds) had been captured as breeders. The presence of young males (those that had not previously bred) in winter may reflect the level of competition among males for nest sites, and the eventual advantage of being on territory sooner in spring in order to obtain the chance to breed. Although migrant yearlings enter the breeding population at levels similar to nonmigrant yearling birds, among those birds which enter the breeding population as second-year birds, a higher proportion of nonmigrant birds were successful in obtaining a breeding site. Thus, despite the potentially heavy cost to survive through winter in Saskatoon, nonmigrants eventually obtain proportionately more chances to breed.

Trapping also enabled me to estimate the number of Merlins in Saskatoon each winter. I used a technique of marking birds with plastic leg streamers that allowed them to be identified from a distance. The number of Merlins seen which had been marked was then compared with the number seen which were not marked. In total, I caught and marked 45 Merlins, 37 of which had been banded as chicks, and were of known age, while 8 had been banded as breeding adults. Nine were seen in more than one winter. Population estimates for Merlins wintering in Saskatoon varied from 22 to 38 birds. Although the number of adults seen each winter remained constant (estimated between 16 and 20 individuals), the estimated number of yearlings fluctuated from 3 to 22 birds and was the primary cause of overall population fluctuations. Why the number of yearlings wintering in Saskatoon varied so greatly from year to year is still a mystery.

An interesting insight was gained by examining the parentage of those birds trapped in winter. Of the 20 birds trapped for which I knew the parents, 19 had at least one parent who had also been trapped in the city as a wintering bird. I also looked at the parentage of birds which returned to breed in the city but had not been captured in winter (and hence were presumed to be migrants). Only 4 of 13 presumed migrants had at least one nonmigrant parent, which was significantly different from the value for nonmigrant birds. Thus, it appears that there is some inherited component in the tendency to remain in Saskatoon as a wintering bird which is passed down to the offspring of nonmigrant birds. If the trend continues, this could have a substantial impact on future Merlin populations leading to a subpopulation of Merlins which is strictly resident in the cities of the northern Great Plains. However, at this point, they are apparently not isolated enough from migrant populations. There is also no evidence that mates are chosen based on their migratory strategy and, with the continued input of genetic material from presumed migrants, at present it is difficult to see a separation between distinct resident urban and migrant rural populations.

We now know that the population of wintering Merlins in Saskatoon is composed of males and females in relatively equal numbers, with more younger males than older males and conversely fewer younger females than older females. I looked at the parentage of both nonmigrant and migrant birds, but moving forward to their offspring can also be informative in terms of determining the advantages of being nonmigratory. One means of addressing this is to look at the number of offspring nonmigrant birds compared to the number produced by presumably migrant individuals. Twenty of the 45 Merlins I trapped in winter subsequently bred in the city. Comparing the average number of young produced in the nests of nonmigrant males with that of nests with a presumed migrant male (regardless of whether the female is a migrant or nonmigrant bird) revealed that more young were produced in the former than the latter. This raises the related question of what is gained among males by not migrating, and how this might relate to more young being produced. Presumably, year round residency enables nonmigrants to be on territory sooner than migrants, occupying the preferred or best quality sites first. I saw Merlins moving from wintering areas in the city to new nesting areas in late winter (February - March) and some courtship activity occurring as early as the first week of February. Since migrant birds do not begin to arrive until late March most years, there is a substantial difference in when members of these two groups can be on the territory they chose for the following breeding season.

Nonmigrant birds are also likely to be more familiar with an area than their migrant counterparts, which would be particularly beneficial to males, who do all the hunting for a pair and their offspring from the courtship through to the second week of the nestling period. This familiarity may make them more efficient at exploiting the resources in their territory, which may in turn allow either an increase in the number of young produced, or the production of better quality chicks. The absence of a similar benefit to nonmigrant females may reflect the apparent lack of mate selection favouring the pairing of nonmigrant birds, as well as the differences in their roles during reproduction. Since the female does little hunting until later on in the breeding cycle, familiarity with an area may not be as important.

**Merlins Wintering in the City Habitat** How do wintering Merlins use the various habitat types in the city? How does this relate to the location of their breeding sites? As mentioned earlier, part of this study was based on monitoring the movements of Merlins equipped with radio transmitters.[16] Selected individuals were fitted with 4-g, battery-powered transmitters which broadcasted a signal that could be picked up by specialized receiving equipment. This technique (radio telemetry) allowed me to maintain contact with individual Merlins (often visually) as they moved about their home ranges in the city. The transmitters are small enough, and attached in such a way to the tail feathers, to minimize any impact on the bird and its behaviour.

Winter home ranges for eight birds followed during the study varied from 9 to 40 ha with an average size of 19 ha (1 ha = 10,000 $m^2$ or 2.5 acres). Adult birds which had bred in Saskatoon the previous summer had much closer ties to their old territories of the past than yearling birds to their natal nest site. While none of the three yearlings had winter home ranges that included their natal site, the home ranges of four of seven adults contained their last nest site and all four of these had one frequently used nighttime roost within 100 m of their old nest. Over 90% of nests found between 1985 and 1987 were in the oldest habitat types occupied by Merlins (built prior to 1945, or those from 1945 to 1960).[13] So, just as their nest sites focus Merlin activity on older residential areas of Saskatoon, their winter activities are also centred on these areas to a large extent. However, unlike a nest site during the breeding season, the nighttime roost of a wintering Merlin does not appear to be a focal point for activity. Although it appears that adults are likely to have a small number of frequently used roosts, the consistency of return to one roost varies from using a main roost 26% to 100% of the time.

There were distinct differences in the use of habitat types by adults and yearlings. While adults used mostly residential areas of the city built prior to 1960, yearlings also made frequent use of areas built as late as 1970. Both groups avoided use of the newest neighbourhoods in the city which is likely related to the lack of perching places - these areas are relatively devoid of trees and lack utility poles. Both groups also made extensive use of Commercial-Industrial habitat in the city, focusing on places like railyards, and seed-cleaning plants, which are areas with high concentrations of House Sparrows. This is the habitat in which Merlins made nearly 50% of their hunting attempts. Among residential areas, the oldest habitats have the highest densities of House Sparrows, which may also help to explain the heavier use of these areas, but more likely (especially for adults) the heavy use of the two oldest habitats again relates back to the occupation (or defense) of a previously held nesting territory. It could also be expected that having spent a summer in one area, these birds are likely more familiar with the area and are more successful hunters because of this familiarity. Considering that some nests were as close as 100 m, and breeding birds tend to remain close to their old nest through the next winter, there was also a great deal of overlap in winter home ranges. This occurred especially among birds which had been paired the previous summer, but also among apparently unrelated individuals. As many as three different birds have used the same prominent perch within the space of several hours. It appears that the areas occupied by Merlins in winter are not exclusively held, or defended, from other Merlins.

An unexpected aspect of Merlin habitat use during winter was their departure from the city to hunt in the surrounding countryside in farmyards and feedlots as far as 15 km away. Some travelled out for the entire day, but most went out and returned within several hours in the morning, repeating the pattern in the afternoon. These Merlins always returned to the city by dark. Four of five adults and one of three yearlings made use of the countryside in this way, suggesting that it may be something that is learned in the first or second year. One explanation for leaving the abundant food supply of the city is the very high density of House Sparrows found in these isolated locations across the countryside. There were also differences in the level of hunting success associated with rural and urban hunting attempts. Average hunting success was 14% in the city, but a substantially better 31% for birds hunting in the country. This difference may be a reflection of the extent of exposure among House Sparrows in these areas to Merlin attacks. In the countryside there are fewer avian predators in winter and these prey may have been exposed to fewer attacks, be less familiar with Merlins, and perhaps less vigilant than birds in the city.

**Closing Remarks** This study has revealed how it is possible for Merlins to inhabit cities on the northern Great Plains. It has also provided potential answers as to why some Merlins have undergone such a dramatic change in their behaviour, from being strictly migratory to remaining in this region through the year. However, this is only a first step towards gaining a better understanding of this behaviour and more work is necessary.

The northward movement of wintering ranges has been noted for a number of different species now, and with the continued acceleration of global warming this is a trend which is likely to continue. With time, more resident populations of Merlins will be established in towns and cities across the northern Great Plains, provided that the required resources are available. Whether this behaviour can be linked to changes in climate, is a matter for discussion. My feeling is that, given a stable climate over the last 100 years, these populations would still have developed. What was lacking previously, and perhaps was not discovered by the Merlins for some time after it became available, was the abundance of both food and suitable roosting sites, which I believe were critical to the beginning of these populations. This is not to say that such warming has not had, or will not have, an impact on Merlins. A warmer winter would be less demanding energetically for those individuals which did stay. This could lead to higher survival rates within these populations and ultimately change them. One potential impact is among yearling females whose survival rates at present appear to be very low in winter. If a greater proportion survive and remain in the city to breed, this could influence the genetic background of the population. At present, most females breeding in Saskatoon are from areas outside the city.[6] If wintering females are more likely to survive and subsequently breed in the city, this could strengthen the development of an "urban" subpopulation, particularly if there is any selection favouring the pairing of nonmigrant birds.

Although quiet and unobtrusive in winter, Merlins are not secretive in the urban habitat and can be easily observed. They add a colourful and exciting component to the avian populations in these cities, completing the food chain. This gives people the opportunity to observe a complete, albeit simple, ecosystem right in their own backyard.

**Acknowledgements** Lynn Oliphant and Paul James contributed to this study in many ways. Financial support was provided by the Natural Sciences and Engineering Research Council of Canada (NSERC), the Canadian Wildlife Service University Research Support Fund, the Frank M. Chapman Memorial Fund of the American Museum of Natural History, the Canadian Plains Research Center, and the University of Saskatchewan. The manuscript was prepared while I held a NSERC Postdoctoral Fellowship; Daniel Hernandez of Museo Nacional de Costa Rica, San Jose, provided access to word processing facilities. Thanks to Jamie Doyle for reading an earlier version of the manuscript.

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"The music of the night insects has been familiar to every generation of men since the earliest humans; it has come down like a Greek chorus chanting around the actors throughout the course of human history." *By Edwin Way Teale. Frank Graham, Jr., Audubon Jan-Feb/92.*

# THE ELUSIVE VIRGINIA RAIL

MABEL CHARLTON, 501 McGillivray Dr., Weyburn, Saskatchewan. S4H 1L9

Rails prefer to escape from an intruder through well worn runways in the sedges, rather than trust their short, rounded wings. The shy, skulking hiders make their way in and out of the cattail mazes over the oozy ground with wonderful rapidity, or at least so I found this past summer when I tried to photograph a nesting female rail.

John Whittel found the nest as he shagged golf balls in a natural stream-like body of water on the Weyburn golf course. Virginia Rails are rather rare birds in our area and our local natural history society members were excited about the find. John told us there was a nest in much the same spot the summer before. He watched it carefully but didn't say too much about it then.

Virginia Rail nest. Mabel Charlton

In the summer of 1992, on the bird's return, John decided to get a positive identification and some pictures for proof. He asked me if I would try to get the pictures. I put on John's rubber boots and with camera, lenses and flash, I waded out (trying not to damage the natural camouflage) as close to the nest as possible.

A battle of wits began. That elusive little bird with its narrow-breasted, wedge-shaped body so quickly forced her way through the grassy, cattail jungle that it was impossible for me to get a clear picture. She made certain there was always plenty of tangle between us. If I got a little too near she would rise feebly, fluttering her wings, just above the tops of the rushes, her long legs dangling limply, then dropping down as if exhausted. A good diver, she could disappear completely. A time or two I saw her clinging to a stout, sturdy stem, submerged, with only her reddish bill above the water. A swift swimmer too, she could get out of range quickly. She was in her own safe territory. In John's rubber boots, I was hardly able to turn, let alone move. If I stood too long and patiently in the same motionless position, I was stuck in the mud.

Interesting birds these rails. Food gathered from the ground is picked off with sharp pecks. Rails can run up the rushes also, clinging there with the help of their hind toes on the swaying stem, and get seeds, insects or berries at the top. Their long, front toes, flattened but scarcely lobed, enable them to tread out a dinner from the mud. Beetles, small crustaceans and small forms of water invertebrates as well as grasshoppers, are favourite foods.

The nest was built on a mound of cattail stems and grasses, on the ground at the marshy, muddy, sodden edge of the water. It was well hidden among tall cattails and wild willows. It seemed almost to have a dome or kind of cover and was full of eggs. The eggs were pale, creamy white, speckled with brown.

It was easy to get a picture of the nest, but I did worry that I might cause the female to desert. The male came when she called but stayed well out of range and was very secretive.

Rails' meat was (maybe still is) considered a delicate, gourmet food. Such a pitifully small, thin body required the cooks to pluck dozens for one meal, thus the expression "thin as a rail."

Rails make only short, weak flights on seemingly feeble wings, yet they may migrate from the West Indies to Hudson Bay. So their flight is not at all as feeble as it appears to be.

I wonder if the pair will return to the same spot for the third year. They did have a successful hatch. I wonder if I will have better luck getting a picture.

Maybe I should try a blind - but maybe not, we don't want them to abandon that perfect nesting site. Maybe I should take along a pocket comb to attract the rails, as scratching the teeth of a comb produces a sound like the rail's call. Maybe that would bring one close.

I am much intrigued with these small, shy birds. They are more often heard than seen. They are so seldom seen that they are virtually unknown. Very few articles and good photographs have appeared in publications.

# EXTRAVAGANT NEST DEFENSE - UNLIKELY TO PAY OFF

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Defense of nests or broods is potentially risky, exposing the parent bird as well as its eggs or young to a predator. When defense is prolonged in time or space or both, it risks attracting other predators besides the one that set off the reaction. If such behaviour occurs in most individuals of a species, we infer that benefits of defense outweigh the costs. With species in which nest defense is not usual, such behaviour may be no more than individual aberration.

Breeding shorebirds, especially sandpipers such as Greater and Lesser Yellowlegs, are examples of species that habitually and persistently protest human intrusions in their nesting areas.[1,2] Gulls and terns defend their nests and young aggressively against humans as well as other animals. Many other examples could be cited.

Ducks, especially dabbling ducks, are well known for "distraction displays" when their broods are approached by people on land as well as on water. Nest defense, however, is not characteristic of ducks and would not be expected, given their relatively clumsy movement on land. In my experience, a duck on its nest usually relies on concealment in vegetation until the last moment. It then departs conspicuously, often quacking while fluttering low over the ground, sometimes for 200 m or more, in an attempt to distract the predator away from the nest. Two Mallard females that I encountered nesting on my study plots near Mafeking, Manitoba, in 1972 behaved in this typical manner, but a female Ring-necked Duck there provided an aberrant exception.

Most Ring-necked Ducks nest in shrubby marshes, close to or over open water, as these diving ducks are less agile on land than Mallards. The study plot was in the shrubby zone fringing a boggy impoundment, with no obvious surface water nearer than 300-400 m.[3] On 1 July 1972, at 5:55 a.m., I flushed a female Ring-necked Duck from an incomplete clutch (6 eggs, no down) in an open sedge area, 50 ± cm from a marked line I had followed on 8 surveys over the previous 5 weeks. On that visit, and again on 5 July (9:05 a.m.; 8 eggs, little down), the duck flew away normally, with considerable commotion. My final visit, during a survey of the plot's vegetation on 8 July, produced the following different response [slightly expanded from my field notes]. When I was 1.5 ± m from the nest, the duck came off, flapping around my feet as if feigning near a brood. As I moved closer, she beat up against my waders. I caught her by hand, checked her legs for bands (none) - as I wondered if such unusual behaviour indicated a captive-reared bird familiar with people. Then I tossed her into the air. Instead of flying away, she came down immediately and, as I bent over to count the eggs (still 8, little down), she rushed onto the nest and covered it, and then moved out at me aggressively. As I moved away, she returned to the nest "like a broody hen." I did not revisit the plot later.

If such a response had been made to a mammalian predator, that duck would not have survived to bring off her nest. Her activity, except when I tossed her into the air, was on the ground, so it need not have attracted other predators. It is conceivable that the duck, "remembering" from earlier visits that I had not then been distracted by her conspicuous departures, was trying a different defense. However, I cannot imagine such behaviour providing any benefit either to the present clutch or to the lifetime reproduction of the parent. Its apparent success in defending its nest against me is unlikely to have been a helpful precedent. Such behaviour is not "for the birds," but works against them.

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# POSSIBLE SASKATCHEWAN SIGHTING OF BLACK VULTURE

On 25 May 1992 I saw a black-coloured bird about the size of an Osprey hovering and soaring over the south edge of Qu'Appelle Valley, 1.5 km west of Fort Qu'Appelle. It soared like a Turkey Vulture, but intermittently it would hover with a great flapping of its wings. I watched it for about a minute at a distance of about 1/6 km ( a quarter of a mile) with 16x binoculars. It was all black underneath and had a prominent white patch on the underside of each wing near the tip. The sun was at right angles to the bird and myself, so I was getting a shaded view of it. The tail differed from that of the Turkey Vulture in that it was short and spread.

I checked my bird guide and found that it resembled the picture of the Black Vulture. When I went to watch the bird again it moved off high into the sky, and off to the west. I then phoned in the report to the Regina bird alert as a "possible" sighting of a Black Vulture. I was still not fully persuaded in my mind as to whether it was a melanistic Osprey or a Black Vulture, for Ospreys will sometimes show fairly prominent white patches near the wing-tips. The next day I drove west along the valley. I did not see the bird again, but I did see several Ospreys. Their manner of flight was so different from the bird I had seen the day before that I was persuaded that it had to be a Black Vulture.

The Black Vulture normally ranges north to the southern tip of Illinois. There are records of stray birds north to southern Ontario, British Columbia and Yukon. Most (if not all) previous reports of Black Vultures in Saskatchewan have proven to be immature Turkey Vultures for the immatures have black heads instead of red. This unconfirmed report only places the Black Vulture on Saskatchewan's list of hypothetical birds.

- *RONALD R. HOOPER*, Box 757, Fort Qu'Appelle, Saskatchewan. S0G 1S0

# SASKATCHEWAN SIGHTING OF A RED-SHOULDERED HAWK

On 14 September 1990 I saw a medium-sized hawk on a power pole as I drove north on Highway 35 about 8 km north of Bankend, Saskatchewan. It had a dark brown back, head and wings. The shoulder was reddish brown, contrasting strongly with the dark brown of the rest of the wing. It was obviously a Red-shouldered Hawk, which is only hypothetical on the Saskatchewan bird list, as it has not been confirmed by a specimen or a photograph. In the *Field Checklist of Saskatchewan Birds* (1990), Bob Kreba reported four sightings of this species for the province. Unfortunately, I did not have a camera with me to confirm the record.

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# 1991 WHITE PELICAN AND DOUBLE-CRESTED CORMORANT NEST CENSUS IN SASKATCHEWAN

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During the summer of 1991 the Saskatchewan Museum of Natural History and Saskatchewan Parks and Renewable Resources (SPRR) jointly conducted a census of American White Pelican and Double-crested Cormorant colonies in the province. A total of 14 pelican and 35 cormorant colonies was censused from 6-14 June. The last time the colonies were surveyed was in 1985.[2] Survey methods included flying over traditional and newly reported nesting sites and taking aerial photographs at this peak incubation period. Incubating adults were counted from the photos to determine the number of nests.

In 1991, a total of 17,459 White Pelican and 19,547 Double-crested Cormorant nests were counted (see Tables 1 and 2). This represents a decrease of 472 pelican nests (2.6%) and an increase of 2,921 cormorant nests (17.6%). The number of active colonies increased by one for the pelican and by nine for the cormorant. Four pelican and 15 cormorant colonies were new since the 1985 survey. However, three pelican and six cormorant colonies had been abandoned since the last survey.

All the abandoned colonies occurred in the southern part of the province. Pelicans abandoned colonies at Cypress, Basin and Lenore lakes while cormorants abandoned colonies at Cypress, Basin, Lenore, Mud, Old Wives and Reed lakes. Drought conditions and low water levels since the 1985 survey appear to be the main cause for the abandonment of all but the Cypress Lake colony. The cause for abandonment there is not readily apparent. Not only did both species abandon the nesting island at Cypress Lake, but so did the Ring-billed and California gulls. In 1969, the cormorant colony there was the largest in the province.[3] Old Wives Lake dried up in 1987 and has remained virtually dry, up to and including 1991. However, even though the cormorants have abandoned this site, the pelicans continue to nest in reduced numbers. The pelican colony has declined from 2,184 nests in 1985 to 582 in 1991. In 1988, there were reported to be approximately 60 young produced at this colony (E. Wiltse, SPRR, pers. comm.).

There were four new pelican colonies since the 1985 survey. These included one at Last Mountain Lake, two at Dore Lake, and one at Primrose Lake. The 15 new active cormorant colonies consisted of 1 each at Suggi, Primrose and Preston lakes, 3 at Wasekamio Lake, 4 at Last Mountain Lake and 5 at Churchill Lake. The colonies at Wasekamio were first reported in 1990.[1] At that

**Table 1. 1991 NEST CENSUS OF AMERICAN WHITE PELICAN IN SASKATCHEWAN**

| Location | Date | Census | Pelican Nests[a] | | | |
|---|---|---|---|---|---|---|
| | June 1991 | time | 1991 | 1985 | change | % change |
| Basin Lake[b] | 6 | 1315 | — | 227 | -227 | -100 |
| Cypress Lake[b] | 6 | 1655 | — | 90 | -90 | -100 |
| Dore Lake | 11 | 1030 | 742(2) | — | new | — |
| Iroquois Lake[c] | 6 | 1345 | — | — | — | — |
| Kazan Lake | 11 | 1750 | 1004 | 1145 | -141 | -12.3 |
| Last Mountain Lake | 6 | 0750 | 804 | — | new | — |
| Lavallee Lake | 11 | 0945 | 4890 | 4897 | -7 | n.s. |
| Lenore Lake[b] | 6 | 1300 | — | 162 | -162 | -100 |
| Mud Lake | 6 | 0900 | 210 | 462 | -252 | -54.5 |
| Old Wives Lake | 6 | 1830 | 582 | 2184 | -1602 | -73.4 |
| Preston Lake | 13 | 1330 | 70 | 157 | -87 | -55.4 |
| Primrose Lake | 13 | 1900 | 5247(3) | 6652(2) | -1405 | -21.1 |
| Redberry Lake | 6 | 1410 | 524 | 347 | +177 | 51.0 |
| Suggi Lake | 11 | 0830 | 3386(2) | 1608(2) | +1778 | 110.6 |
| Total no. nests | | | 17459 | 17931 | -472 | -2.6 |
| No. of islands | | | (14) | (13) | (+1) | |
| Average nests/island | | | 1247 | 1379 | -132 | -9.6 |

[a] Number of nesting islands, if more than one, in parentheses

[b] Abandoned since 1985 survey

[c] Reported in 1991 that pelicans were nesting in 1989

n.s. not significant

time, a cormorant colony was reported for Peter Pond Lake; however, due to higher water levels flooding the small island, the colony was not active in 1991. A pelican colony was reported to be active at Iroquois Lake in 1989 (P. Parsons, pers. comm.), but was not found in the 1991 survey.

Pelicans experienced nest declines at Kazan, Mud, Old Wives, Preston and Primrose lakes while enjoying increases at Redberry and Suggi lakes. The most significant increase was at Suggi Lake where the nest count rose from 1,608 in 1985 to 3,386 in 1991. The Lavallee Lake colony remained stable. Aside from the abandoned colonies, cormorants increased at all colonies except at Churchill Lake where the number of nests remained stable in spite of an increase in nesting islands from 7 to 12. The most significant nest increases occurred at Kazan (+742), Last Mountain (+1,090), Lavallee (+648), Primrose (+1,119) and Suggi (+811) lakes.

In summary, the number of pelican nests remained relatively stable since the 1985 survey, experiencing only a slight decline (2.6%). Cormorant nests increased by 17.6% since 1985. Generally, the southern colonies experienced the more significant losses due in large part to the lower water levels while the northern colonies suffered fewer losses and appear to be doing quite well. It is good to see that pelicans are

**Table 2. 1991 NEST CENSUS OF DOUBLE-CRESTED CORMORANT COLONIES IN SASKATCHEWAN**

| Location | Date | Census | Cormorant Nests[a] | | | |
|---|---|---|---|---|---|---|
| | June 1991 | time | 1991 | 1985 | change | % change |
| Basin Lake[b] | 6 | 1315 | — | 745 | -745 | -100 |
| Churchill Lake | 13 | 0900 | 2506(12) | 2508(7) | -2 | n.s. |
| Cypress Lake[b] | 6 | 1655 | — | 553 | -553 | -100 |
| Dore Lake | 11 | 1030 | 2497(3) | 2204(3) | +293 | 13.3 |
| Kazan Lake | 11 | 1750 | 3862 | 3120 | +742 | 23.8 |
| Last Mountain Lake | 6 | 0750 | 2854(7) | 1764(3) | +1090 | 61.8 |
| Lavallee Lake | 11 | 0945 | 2263 | 1615 | +648 | 40.1 |
| Lenore Lake[b] | 6 | 1300 | — | 853 | -853 | -100 |
| Mud Lake | 6 | 0900 | — | 26 | -26 | -100 |
| Old Wives Lake | 6 | 1830 | — | 96 | -96 | -100 |
| Peter Pond Lake.[c] | 13 | 1000 | — | — | — | — |
| Preston Lake | 13 | 1330 | 85 | — | new | — |
| Primrose Lake | 13 | 1900 | 2336(3) | 1217(2) | +1119 | 91.9 |
| Redberry Lake | 6 | 1410 | 102 | 43 | +59 | 137.2 |
| Reed Lake[b] | 6 | 1800 | — | 45 | -45 | -100 |
| Suggi Lake | 11 | 0830 | 2648(3) | 1837(2) | +811 | 44.1 |
| Wasekamio Lake[d] | 13 | 1020 | 394(3) | — | new | — |
| Total no. nests | | | 19547 | 16626 | +2921 | 17.6 |
| No. of islands | | | (35) | (26) | (+9) | |
| Average nests/island | | | 558 | 639 | -81 | -12.7 |

[a] Number of nesting islands, if more than one, in parentheses

[b] Abandoned since 1985 survey

[c] First reported active in 1990: 30 nests

[d] First reported active in 1990: 191 nests

n.s. not significant

establishing themselves once again on Last Mountain Lake.

**Acknowledgements** We thank Dave Dalke for his capable piloting for the survey. Thanks go to Merv Syroteuk, A/Superintendent, Prince Albert National Park, and the personnel of the Department of National Defense, Medley, Alberta, for granting permission to census the colonies at Lavallee and Primrose lakes, respectively. Also we thank Kevin Callele for assisting one day with the survey.

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2. RONEY, K. and M. HLADY. 1986. 1985 Census of pelican and cormorant colonies in Saskatchewan. *Blue Jay* 44:177-179.

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# STATUS OF NEOTROPICAL MIGRANT SONGBIRDS IN MANITOBA - TIME FOR A SECOND LOOK

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There is a growing awareness in Canada and throughout the world of the tremendous extent and possible consequences of deforestation in both tropical and temperate regions. While attention has been focused largely on aspects of climate change and the overwhelming loss of the world's biodiversity, fewer Canadians will be aware of the more immediate effects on local populations of breeding songbirds.

*Canada Warbler banded at Delta, 8 September 1992.*

*Keith Hobson*

Neotropical migrants, those birds breeding in the temperate regions of North America but who winter and indeed spend most of their lives in Central and South America or the Caribbean, are facing tremendous pressures from habitat loss.[3,4,5] This pressure is in addition to a host of other, often related, factors such as predation, parasitism by Brown-headed Cowbirds and the widespread use of pesticides.[2,5,6] Indeed, during the last decade, alarm bells have been ringing in the minds of scientists and naturalists alike as data indicating steady declines in several songbird populations accumulate.[4] However, these trends are largely based on studies of populations of migrants that move through and breed in the hardwood forests of the eastern United States and it is generally not known to what extent populations of songbirds may be declining elsewhere throughout the continent.[1,4]

The vast majority of songbirds known to breed in the woodlots and forests of Canada winter south of the U.S.-Mexico border and are potentially at risk due to habitat change. Diamond estimated that 79 species of birds that breed in Canada winter only in the tropical forests of Central America and most of these can be found in the Canadian prairie provinces.[3] Diamond's estimate included 27 species of warblers alone.

*Enid Cumming banding a Magnolia Warbler at the Delta station.* *Keith Hobson*

Several methods have been used to monitor the populations of birds in North America. Many naturalists will be familiar with the roadside Breeding Bird Survey (BBS) sponsored jointly by the U.S. Fish and Wildlife Service and the Canadian Wildlife Service. This program provides an invaluable continent-wide analysis of the trends in populations of birds breeding north of Mexico but is necessarily restricted to regions that are accessible by car. Several BBS routes have been established on the Prairies but many more are needed to provide more adequate coverage in most regions. Banding stations, where birds are captured by mistnetting, also provide information on the status of migrant songbirds. Rather than being a technique to establish wintering grounds or migration routes through band recoveries, the banding of migrant songbirds is typically used to determine population status, survival and productivity of birds through constant-effort mistnetting. Ageing of birds through the examination of skull bone development and the evaluation of body condition by visually scoring the fat deposits around the neck and breast add tremendously to the value of mistnetting songbirds.

The paucity of data on populations of neotropical migrants occurring in the Prairies has prompted the Canadian Wildlife Service (CWS) to establish a monitoring station at Last Mountain Lake in Saskatchewan. Operated by Al Smith (CWS, Saskatoon) in spring and fall, it compliments similar efforts in Alberta, such as the Beaverhill Bird Observatory. Routine netting at these stations will help us establish the population status and reproductive success of some species but will not tell us how neotropical migrants may have declined historically in this region. Fortunately, a banding study conducted in the early 1980s has provided an

*Adult male American Redstart banded at Delta, 15 September 1992.* *Keith Hobson*

excellent opportunity to monitor possible declines of warblers moving through south-central Manitoba.

From 1982 to 1984, Heidi den Haan, under the supervision of Dr. Spencer Sealy of the Department of Zoology, University of Manitoba, conducted spring and fall banding of warblers moving through the narrow dune-forest along the south shore of Lake Manitoba. This area is an ideal location to mistnet migrant songbirds because it is bordered on one side by the lake and on the other by Delta Marsh. Migrants are thus likely to stop and move along this strip of forest before continuing on their way to the breeding or wintering grounds. The recent interest in the status of neotropical migrants by CWS and the willingness of Dr. S.G. Sealy and Heidi den Hann to collaborate in a follow-up study provided the necessary impetus for CWS's recent program established at the University Field Station at Delta Marsh.

In July 1992, with the assistance of Heidi den Haan who helped locate the positions of the mistnet sites she had used previously, we set up a three-year banding program. Several years of dormancy had left the sites a veritable jungle of nettles, burdock and willows, but in a few days the 12-metre nets were set up, ready to catch their first migrating songbirds. Paula Grieef and Enid Cumming, graduate students at the Universities of Manitoba and Saskatchewan, respectively, were hired to operate the station and, with the help of Marlene Gifford (University of Manitoba) and other volunteers, captured and banded over 3500 passerines between 15 July and 26 September. The resounding success of the operation occurred in spite of often poor weather conditions and the threat of predation of netted birds by foxes, hawks, and even white-tailed deer.

Highlights of this year's banding program included a Golden-winged

Warbler (en route from Riding Mountain Park?), a male Black-throated Blue Warbler, a Yellow-throated Vireo and (believe it or not) a young Double-crested Cormorant. However, although these rarities are interesting, our main focus was on the more typical species to move through this site such as Ovenbird, Northern Waterthrush, American Redstart, and Yellow-rumped, Orange-crowned, Tennessee and Black-and-White warblers. In the years to come, we will be able to evaluate the status of these species with respect to their abundance a decade ago.

Following the end of the study in 1994, it would also be extremely valuable to establish a permanent banding station at this site. Such a station would complement the other two permanent facilities in Saskatchewan and Alberta and provide valuable training and educational opportunities for graduate student and naturalist alike. The success of the Long Point Bird Observatory in southern Ontario attests to the effectiveness of involving volunteers and researchers in such a venture.

Our research program now established at Delta Marsh is a small step in an attempt to establish which of the songbirds are currently most at risk. Apart from a need for more effective monitoring, more information is also needed on the habitat requirements and general ecology of many of our migrant songbirds. However, only through the interest and encouragement of the public will we see such monitoring and research supported and, with time running out for many of our songbirds, such public interest cannot come too soon.

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* * *

May is the transition month, and exists to connect April and June, the root with the flower. *John Burroughs. 1895. Wake Robin. Houghton Mifflin, Boston.*

# FIRST NESTING RECORDS OF THE HOUSE FINCH IN MANITOBA

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Recently, Bancroft and Parsons reviewed known sightings of the House Finch in the three Canadian prairie provinces up to and including the end of December 1990.[3] They speculated on whether or not nesting would occur and if the House Finch would become regular in the region. In the time between the writing of that article and its publication, there were no fewer than three nesting records of the House Finch in Manitoba - one was in Winnipeg and two were in Brandon.

**Details of 1991 Nesting Records** Dan Bulloch and Louise Vermette, who live in south St. Boniface, which is an eastern suburb of Winnipeg, discovered the nesting pair in Winnipeg. Three House Finches, two males and a female, appeared at their feeder on 28 May. One of the males settled into a fairly regular routine of visiting and was seen over the next few days by several observers including Dennis and Frieda Fast, Robert Parsons, Andre Courcelles, and Lewis Layman. After several attempts, this bird was photographed (Figure 1). Evidence of breeding was obtained on 28 June when the adults showed up at the feeder with three fledglings. (Not two fledglings as reported in *American Birds*.)[22] Both the "regular" male and the female were observed feeding the young birds over the next few days. The second male remained in close association with the pair, but was not observed feeding the fledglings. The birds remained for a few days before disappearing. However, in mid-July, a male and female House Finch began to visit the yard of Angus and Betsy Shortt until 25 August 1991.[20] It is likely that these were some of the same birds, with the correlation of dates and since it is a distance of only 1 km away.

In Brandon, on 27 June, Jean Horton observed a male House Finch at close range visiting her feeder in a residential area in the western part of the city. The bird remained for about 10 minutes and was observed in detail. This was the second report of a House Finch in Brandon. (An earlier sighting, overlooked by Bancroft and Parsons, was a male reported by Mamie McCowan on 29 April 1990 at her feeder in south-central Brandon. This bird was also seen by Barbara Robinson.) The first definite breeding evidence for the Brandon area was obtained on 8 July. Carole and Murray Sangster returned from holidays to find a male House Finch visiting a feeder at their home, west of the Agriculture Canada Research Station in Brandon. (Perhaps the same bird as Horton's sighting?) It was accompanied by six young House Finches. The young birds were being fed by the male. The visits continued over the course of a few weeks and all the birds were observed by Horton, Robinson and others during the period. Frequently, the male would fly to a hydro wire above the feeder and perch for a few minutes before approaching the feeder. Although the

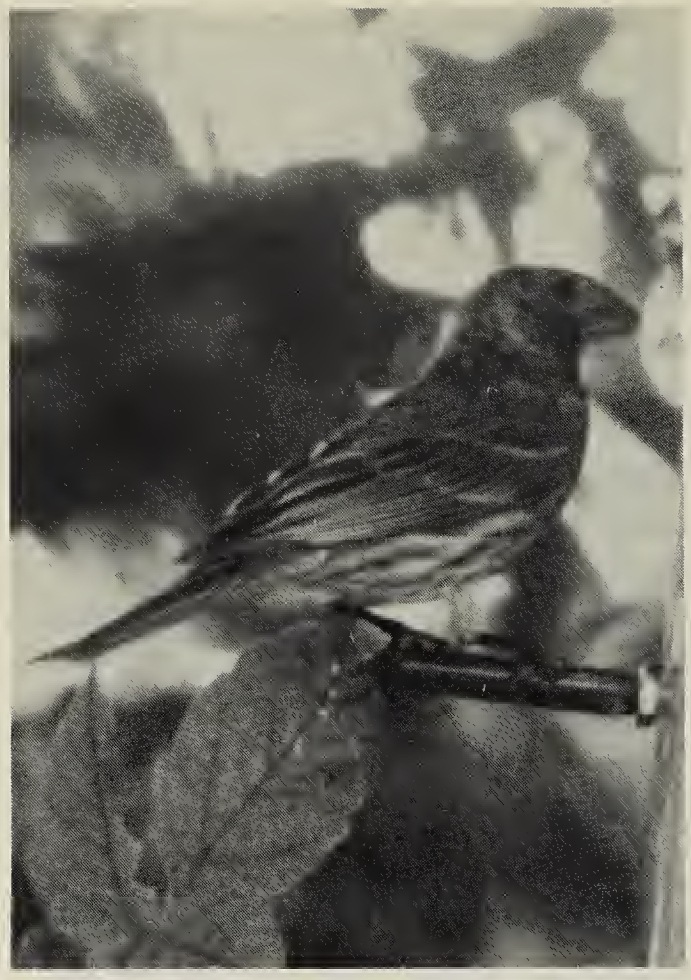

*Figure 1. Male House Finch visiting feeder in Winnipeg. He would later bring young to this feeder.*
*Louise Vermette*

Sangsters searched their property and kept a close eye on the birds, a nest was not found. This House Finch family remained in the area until 15 September.

Shortly after the record of the Sangster nesting had been established by photograph (Figures 2 & 3), another occurred. On 19 July, Millie and Len Wenger, who live in the east end of Brandon, observed a male House Finch at their feeder. This bird was also seen by Harold Watson of Brandon.[25] Then, on 29 July, Bob and Jean Horton, Linda Seitz and the Wengers observed a male and female House Finch at the Wenger feeder. As in the previous instance, the male would perch on a hydro wire for a minute or so (Figure 4) before coming to a tubular pole feeder about 1.5 m above the ground. The feeder was situated in front of the kitchen window where the birds came regularly to feed on Niger seeds. The male favoured a Colorado spruce (*Picea pungens*) in a neighbouring yard as a perch. This popular ornamental tree has been noted as a favourite nesting site.[4,18] However, a nest was not found. On 21 August, four young were observed. They frequented the feeder for the next month. Later, the Wengers identified them as two of either sex, after the fall moult, when the red colouring of the males became apparent. The Wengers saw the young House Finches for the last time on 6 October 1991 and noted that the adult male had left one week earlier.

**Thoughts and Theories on the Nesting Records** While none of the nests were actually found, we can extrapolate to get some idea of clutch size, approximate nesting dates and other features of interest.

Although we do not know the exact number of eggs in each clutch, we do know the minimum number. The Winnipeg nest contained at least three eggs, while one Brandon nest had at least four eggs and the other had at least six eggs, based on the number of young fledged. These numbers are within the normal range of two to six eggs.[19]

According to Bent, nest building takes two days to a week to complete.[4] Egg laying proceeds at one per day.[19] Incubation lasts from 12 to 16 days.[19] The nestling period ranges from 12 to 19 days.[4,19] If we assume the parent birds brought their young to the feeders immediately upon fledging, we can extrapolate the following nesting dates. The Winnipeg nesting could have begun as early as 14 and as late as 30 May. The latter end of this range corresponds with the first observation of this family group. The Sangster

*Figure 2. One of thirteen House Finches known to have fledged in Manitoba in 1991.*

*Jean Horton*

nesting at Brandon could have begun as early as 21 May and as late as 6 June. This range could possibly be revised to a few days earlier, since the Sangsters only discovered the House Finch family after returning from vacation. The Wenger nesting at Brandon could have begun as early as 6 and as late as 22 July. The initial observation time corresponds with the shorter period. It would appear that Manitoba's House Finches had little trouble fledging young, since the evidence favours a near minimal nesting period in at least two of three cases.

The dates for all three nests are somewhat later than those given in the literature which suggests late April as the norm for northerly populations to begin nesting activity.[4,19] Since there were no resident House Finches on territory when the normal nesting season began, however, Manitoba had to wait for migrants to arrive. In view of this situation, the later than normal start of nesting is not surprising. If the House Finch becomes a permanent resident in Manitoba, we can expect earlier nest records.

The House Finch is known to be "often double-brooded, sometimes treble-brooded" and generally reuses the same nest.[19] Of the Manitoba nestings, however, only the Sangster nesting record at Brandon suggested that a subsequent nest might have been undertaken. Since only the male parent was seen with the young at the feeder, there was speculation that the female was possibly renesting. If this was the case, however, it appears to have been unsuccessful since no further young appeared. Although the dates do not rule it out, it is unlikely that the same female was involved in both Brandon breeding records. The observations were at opposite ends of the city, a distance of 8 km. As well, we have not been able to find any evidence of polyandrous mating of the House Finch in the literature, at least while the first male survives. While the Wenger nesting was taking place, the first male was still tending his brood. It is possible that the comparatively late dates of the Manitoba nestings discouraged any renesting.

The presence of the extra male accompanying the Winnipeg pair is intriguing. It may be an example of a nest helper as already documented in the House Finch.[24] It was not observed feeding the young, but Bulloch and Vermette stressed that they were away at work all day and could have missed such behaviour. Certainly, the tolerance displayed by the other two adult birds toward it supports this possibility. The "regular"

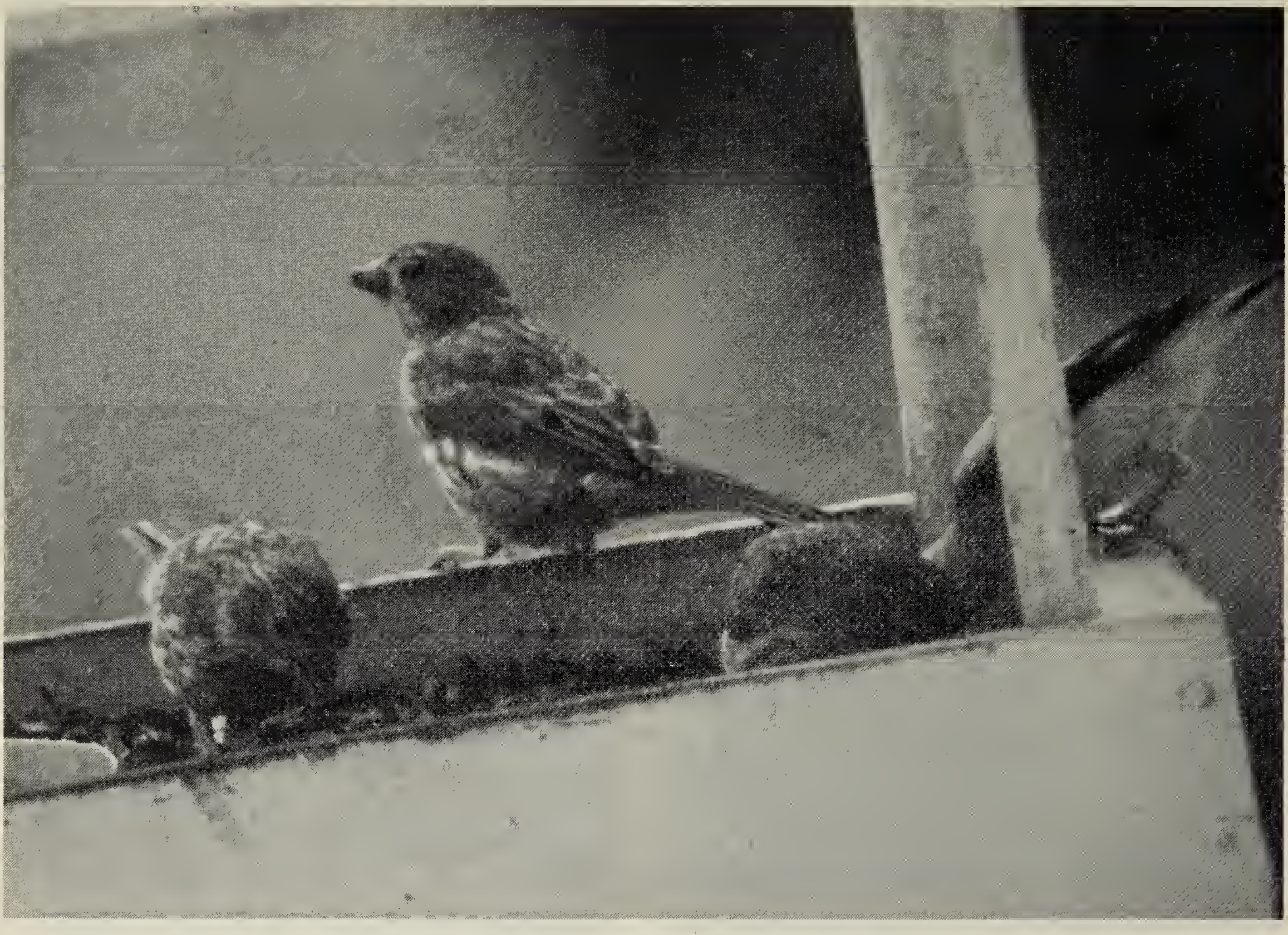

*Figure 3. Half of the largest known brood of House Finches found to date in Manitoba.* *Jean Horton*

male was much more colourful than the second male. He, by his colouring, his regular presence and his feeding of the young birds, was assumed to be the parent.

**Recognition of House Finches** Although the three nesting records described are the first ones that we know of, it is possible that others have been missed. The problem is that many observers are simply unaware of the presence of House Finches and misidentify any that they see as Purple Finches. In an attempt to address this problem, we wish to note the following:

The House Finch is slightly smaller and more slender than the chunkier Purple Finch. Proportionally, the tail of the House Finch is longer and less noticeably notched, while the bill is smaller. The head is flatter than the more peaked crown of the Purple Finch.

The male House Finch has the red colouring restricted to the crown, upper breast and rump. This contrasts with the brown back and wings. Most adult male Purple Finches have a more extensive red wash throughout their plumage. The belly and flanks of the House Finch are fairly heavily streaked, while the Purple Finch usually has little or no streaking there. In general, the House Finch tends toward more red and orange colours, while the Purple Finch tends toward more pink and rose colours. However, there are exceptions to this rule in both species.

The female House Finch has a relatively plain, unmarked face with only faint streaking, which is more reminiscent of the facial pattern of a Pine Siskin than a Purple Finch. The female Purple Finch has strong facial

*Figure 4. Male House Finch on wire, a sight Brandon birders were treated to in the summer of 1991.*

*Bob Horton*

markings consisting of a light eyebrow, dark "ear" patch, and a dark "mustache." Although the distinguishing features of females require a better look, they are less variable and, therefore, more reliable.

**Evolving Trends in the Manitoba House Finch Population** The House Finch's range expansion into Manitoba is well underway. The first sighting of House Finch in Manitoba was in 1983.[21] David Lambeth, a regional editor for *American Birds* Northern Great Plains Region, informs us (pers. comm.) that the first sightings of House Finch in most states preceded the first nesting record by about 10 years. The Manitoba situation, with a nine year interval, fits this pattern very closely. As all three nests succeeded, it looks as though the House Finch may become at least a summer resident in Manitoba. Time will tell if it becomes a permanent resident.

In order to speculate on whether or not we might expect the House Finch to continue nesting in Manitoba, it is necessary to examine its nearby northern range.

The Winnipeg nesting can be seen as a natural northward expansion of the breeding range along the Red River Valley. This would mean there is now a continuous breeding range all the way south to the well-established eastern North Dakota population. This theory is supported by the many sightings along the Red River Valley.[3] These stretch from just north of Winnipeg, south to the U.S. border. Most sightings in Manitoba are from this area. It is especially interesting that such a large number (seven) of these occurred in the year immediately before the discovery of the nesting birds. There may well have been, therefore, some undiscovered nests between the only known Winnipeg nesting record and the House Finch's North Dakota range. This is quite possible with so few birders in Manitoba. The nesting record in North Dakota nearest to Winnipeg is at Grand Forks - 225 ± km away.

In contrast to the Red River Valley region, there is no tradition of House Finch sightings in the western part of the province. Indeed, before 1991, there were only two sightings anywhere in western Manitoba. These were the above mentioned sighting by McCowan, and one at Carberry, from 17 November to 4 December 1990.[3] There are no others known from Brandon to the Red River Valley. There is, however, evidence that House Finches nested in the Minot, North Dakota, area in 1991, according to Lambeth (pers. comm.). Minot

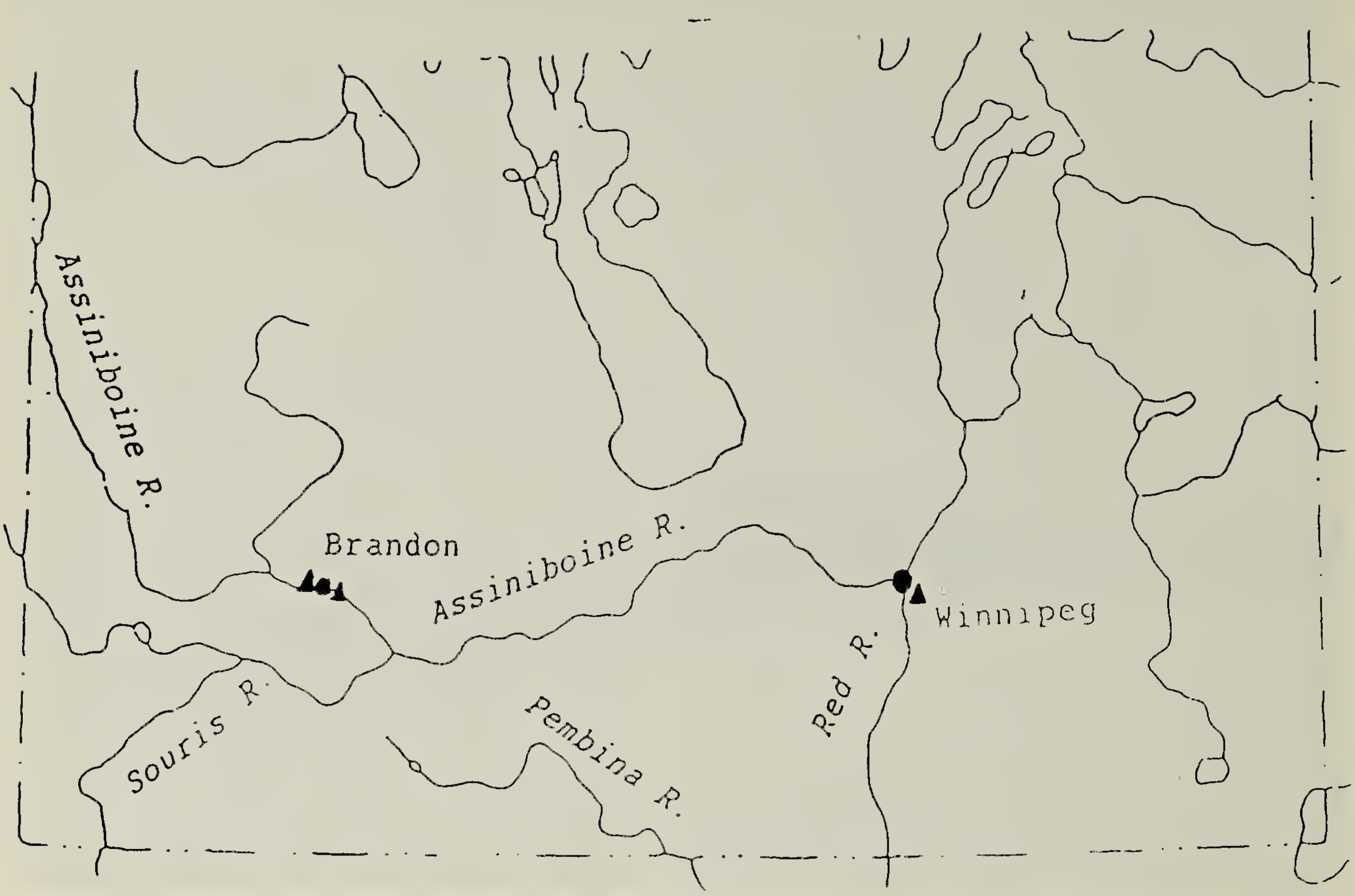

*Figure 5. Map of southern Manitoba showing the river valleys discussed in the text. Triangles represent the approximate nest locations.*

is only 195 km southwest of Brandon. The Brandon nests, along with the one at Minot, show that the House Finch's westward expansion is still underway. More such records, therefore, can be reasonably expected.

At roughly 50 degrees latitude, the three Manitoba nesting records are the most northerly locations so far discovered for the eastern House Finch population. This isolation does not mean that the existence of a viable population of House Finches is out of the question.[1,6,17,23] After all, the initially isolated population at Fargo, North Dakota, which appeared in 1987, more than maintained itself until the regular breeding range of the eastern House Finch population reached the area in 1990.[3,5] There is a difference, however. The Fargo birds remained in the general nesting area throughout the subsequent winters.[3] By contrast, most of the Manitoba birds disappeared after nesting.

There were a few fall sightings of House Finches in 1991. These included a female in the Winnipeg area from 9-14 October, seen by Martin Siepman; a male and female on 8 October, and two males and a female on 18 October in Altona, all seen by Mary Krueger. Such sightings of fall migrants are intriguing as they suggest additional nesting birds in the province. After this flurry of sightings, only one bird remained to overwinter in the province. This was a male in Brandon at McCowan's feeder, with visits on 7 December 1991, 29 February and 7 March 1992.

The almost complete disappearance of House Finches from Manitoba after nesting is somewhat surprising in a species which is considered to be relatively sedentary.[1] However sedentary the House Finch may be, it is by no means entirely so, as its explosive range expansion demonstrates. Kenneth Parkes, Curator of Birds at the Carnegie Museum of Natural History in Pittsburgh, informs us (pers. comm.) "although many House Finches stay the winter, some of the eastern population had already begun to develop a migratory pattern when the breeding range was still confined to a relatively small area in the northeastern U.S." He further cites banding recoveries, of birds banded at their museum's field station near Rector, Pennsylvania. One was from Cookeville, Tennessee, which is a distance of 713 km to the southwest. Another was from Penfield, New York, which is a distance of 393 km to the northeast. There are other examples of movements of House Finches in the literature.[1,8] Such findings support the theory that the Manitoba birds migrated to warmer climes. The opposing theory, that all the birds died, is unlikely as their disappearance took place when the weather was still mild. The death of so many birds would indicate an extremely unlikely high mortality.

If one accepts the theory that the House Finches migrated, the question is where they may have gone. A logical possibility is the northern U.S. Midwest region. The states of North and South Dakota, Minnesota, Wisconsin, Iowa and Nebraska are likely destinations. These six states are also a likely source of our House Finches.

In examining these states, one can notice a definite trend over the past few years. Ten years ago no House Finches from the eastern population were recorded on a Christmas Bird Count (CBC) in these states.[2] However, in 1985 they began to appear.[9] CBC results show a sustained increase over the years in all six states.[9,10,11,12,13,14] In 1990-91, the most recent CBC season for which published data are available, the following totals were found: Iowa had 601 House Finches, Wisconsin 569, Minnesota 133, North Dakota 35, eastern Nebraska 52 and eastern South Dakota had 44.[14] In the three western states, wintering House Finches are concentrated in the extreme eastern portions. This, along with the much larger totals recorded in the three eastern states, suggests a northwest movement into Manitoba in migration. As the numbers continue to build, it is logical to expect steadily increasing numbers of House Finches to migrate into Manitoba and nest here. This may be happening already. The following House Finch spring sightings have been reported as of 30 April 1992: in Brandon, a female visited Horton's feeder on 23 March; in Altona, a male and female on 29 March, and three males and a female from 19-27 April, all at Krueger's feeder; in Carberry, a male visited Doug and Margaret Tolton's feeder on 13 April; in Winnipeg, a male was at Siepman's feeder on 28 April, and a male and female fed at Rudolf Koes' on 30 April.

The remaining question is whether House Finches will winter regularly. The bird seen at McCowan's feeder, presumably overwintering, demonstrates that they should be able to, although it must be noted that the winter of 1991-92 was extremely mild. They did, however, also show up on the CBC's at Grand Forks and Minot in the winter of 1990-91.[14] Those at Grand Forks definitely remained through the winter (Lambeth, pers. comm.) and the Minot birds were also believed to have done so.

These, in addition to the Brandon winter record, bode well for the House Finch to become a permanent resident of Manitoba in the near future.

**For the Future** This article would be incomplete without speculations about the further appearance of House Finch nests. All three pairs of finches nested in similar habitat. This consisted of residential suburban backyard settings with fairly mature trees, which has been noted as a favoured habitat by this finch in other locations.[4,16] All were in large communities along major rivers. These also have been identified as prime House Finch habitat by various authorities.[1,4,6,7,14] This apparent predilection for communities along river valleys has three possible explanations. The first is that House Finches are attracted to river valleys and tend to follow them. A second explanation is that humans are attracted to rivers, settle there and modify the habitat to make it more to the House Finches' liking. A third possibility is that because people are more numerous in such locations, the chances of detecting House Finches are much greater.

Using these criteria, some of the larger communities along the Red and Assiniboine rivers are definite possibilities for nests in the near future. Peter Taylor (pers. comm.) suggests the "Pembina Triangle" communities of Altona, Morden, Winkler and Carman as likely to have House Finches nesting in them soon. Certainly these towns have the right kind of habitat. In particular, Altona has had many sightings of these finches reported in recent years.

Another area is the Souris River Valley. Note that Minot, North Dakota, is along the same river valley. Once these most favoured areas (Figure 5) have been filled, the House Finch should continue its expansion by radiating out from the river valleys. Its ultimate range in Manitoba will become apparent only with time.

Although perhaps somewhat beyond the scope of this article, note that the Minot nesting record is also very close to Saskatchewan. The Souris and Qu'Appelle river valleys may provide access for the House Finch to begin making inroads into that province. The area between these two rivers, with an extension to the northwest as far as Regina, is a logical place to expect the first Saskatchewan nest records. While it may seem premature to be talking about House Finches nesting in Saskatchewan, note that this is what most would have thought about Brandon just over a year ago. By this time next year someone may be writing a paper on the first House Finch nest in Saskatchewan.

**Acknowledgements** We would like to thank several people. Dan Bulloch, Louise Vermette, Carole and Murray Sangster, and Len and Millie Wenger gave us and other birders access to their properties to see the birds and answered all our requests for information. The following reviewed earlier drafts of this article, greatly improving the manuscript: Robert W. Nero, Mamie McCowan, Rudolf F. Koes, and Peter Taylor. They also provided data on sightings, and encouraged us throughout. Kenneth C. Parkes, as well as reviewing the manuscript, also drew our attention to, and provided data on, the migratory component of the eastern House Finch population. David O. Lambeth provided information on North Dakota House Finch

sightings, putting Manitoba sightings into perspective. Mary Krueger, Martin Siepman, Rae Anderson, and Angus and Betsy Shortt provided information on sightings. Jean Bancroft encouraged us to write this article.

[Editor's note: In the summer of 1992, Saskatchewan's first known nesting of House Finches occurred in Regina, in the yard of Karen Sealise.]

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# NORTHERN POCKET GOPHERS OCCUPY NEW TERRITORY

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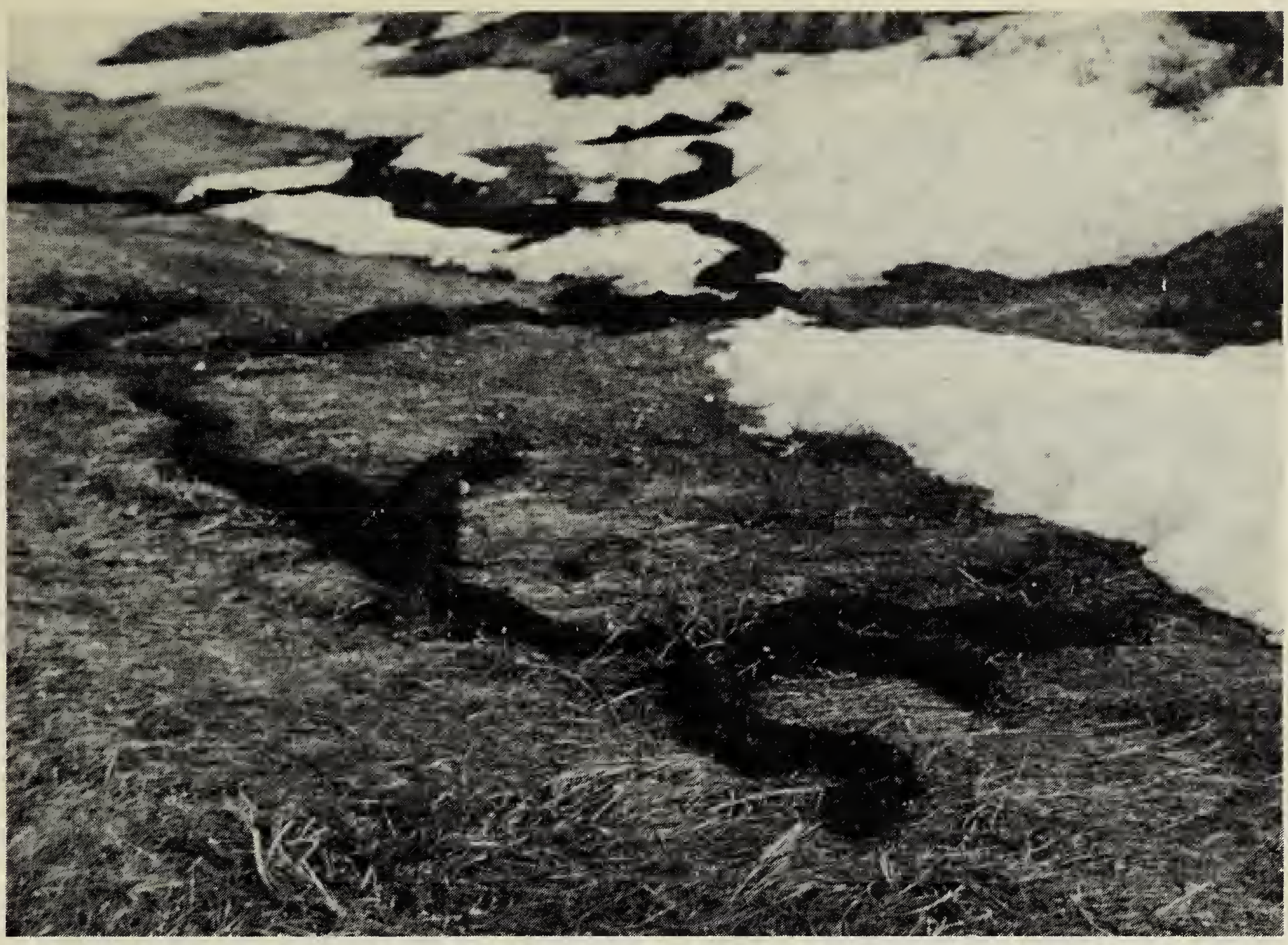
A mammal which has benefited from prairie settlement, insofar as having more habitat accessible to it, is the Northern Pocket Gopher (*Thomomys talpoides*). In Saskatchewan it is "fairly common in certain areas of the province," with a range extending "to Prince Albert National Park."[4] Yet this gopher - sometimes incorrectly called "mole" - is totally absent from other areas of seemingly suitable environment. Often a water course prohibits migration into an area until man facilitates it through bridge construction.

Such was the situation in the parkland region west of the South Saskatchewan River near the town of Rosthern. I had grown up on a farm between the two locations and, in going to either destination, had never seen evidence of pocket gophers. However, I was familiar with them. As a small boy, I had seen their diggings, with an active animal underneath, at the Saskatoon Exhibition Grounds in the early 1940s - and had examined a dead one, killed by a dog, at Wakaw Lake in the last years of that decade.

Banfield and Wrigley tell us that pocket gophers are highly sedentary.[3,5] Their home range is about 125-175 $m^2$, with animals often occupying the same region for the whole of their average three-year lifespan. Any advance into new territory, therefore, would tend to be slow.

The authors also point out that some individuals have been known to wander 1 km in search of better area, and one was once seen swimming across a river 300 m wide. The swift-flowing South Saskatchewan River near Rosthern, although of similar width, proved over the years to be a sufficient barrier to the gophers. (Pocket Gophers do not hibernate, but their forays in winter would not likely take them across any river ice. Their movements then are limited almost exclusively to subterranean wanderings in their tunnels below the frost line where they have caches of food, transported there in their cheek "pockets" during the previous fall.)

Then came 1968 and the construction of the 0.3 km Gabriel Bridge at the former ferry-crossing site. The succeeding years were marked by the presence of characteristic pocket-gopher diggings, now on land west of the river. In spring, with the melting of snow, the ditches of Highway 312 leading westward from the bridge were laced with earthen cores. These were 70-110 mm in diameter, some networks of them totalling 30 m in length (see photograph). These were the earth-filled casts of tunnels which were made through the snow in late winter and early spring when the animals bulldozed excess earth from below



*Network of diggings in roadside ditch near Rosthern, Saskatchewan — evidence of Northern Pocket Gopher.* *V.C. Friesen*

into the snow tunnels of their foraging above surface.

By 1991 the area of telltale diggings and cores extended 4.5 km west of the river, and the district agrologist, writing in the local Rosthern newspaper, devoted an article to "Pocket Gophers - a Growing Problem."[2] Gophers are partial to such crops as alfalfa and field peas, feeding on the green leaves and stems during nocturnal surface forays or else chewing roots from underground and pulling the plant down below. The concern among farmers, however, was not so much over crop loss, which is insignificant, compared to the damage done to haying and harvesting equipment from cutting into the protruding mounds of earth.

By the fall of 1991, the same newspaper reported that the Rural Municipality of Rosthern No. 403 had spent $2000 in purchasing a special underground bait-setting plow which will be rented to farmers to control the spread of the pocket gophers.[1] Since it is not practical to eliminate the animals completely, the Northern Pocket Gopher may now be considered as occupying new territory because of man's direct and specific alteration of the environment.

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# NORTHERN POCKET GOPHERS ABOVE GROUND IN WINTER

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The Northern Pocket Gopher (*Thomomys talpoides*) is known to disperse 1 km and swim 300 m, but is seldom seen above ground in summer, let alone in winter.[4] Wrigley, for example, noted: "I have never seen an untrapped pocket gopher running around on the surface, but one half-frozen individual was brought in by a farmer who had found it lost and wandering through the snow. Its tail was cut, suggesting it had been forced out of its burrow by another gopher."[3] Thus, accidentally finding two on top of the snow on one cold day in winter was completely unexpected.

On the morning of Tuesday, 12 November 1991, Ken De Smet and I crossed a largely snow-covered alfalfa field near Bruxelles in southwestern Manitoba. We both noticed large concentrations of Coyote tracks in the area and two Coyotes were observed there. Ken was surprised to see a Northern Pocket Gopher scurrying around on top of the snow. Winter had arrived there on 22 October when about 24 cm of snow fell and the temperature dropped to near -15°C. The temperature was near -10°C the morning we were there. The gopher had swollen toes and appeared disoriented. It was aggressive when approached, standing on its back legs, jumping and squeaking. When I crossed the other end of the field some 300 m to the north, I too saw a pocket gopher on top of the snow. It was in a similar state with swollen toes and an aggressive disposition. We took pictures of it and left it.

Why were these animals on top of the ground? Indeed, snow covered the ground prior to freeze-up and fresh pocket gopher diggings were evident under the snow in many areas. Both animals were seen on largely snow-free hill tops where the ground was surely frozen to some depth. It appeared that considerable rain had fallen just prior to the snowfall and that the pocket gophers were in search of higher, drier ground. Once out where the ground was not frozen, it was impossible for them to penetrate the frost zone on the bare hills.

How commonly pocket gophers are caught above ground after freeze-up is unknown, but it appeared that the Coyote population was well aware of the phenomenon prior to our discovering it. Seton describes taking a pocket gopher from a white owl on 12 April so the pocket gophers likely emerge early in the spring.[2] Their digging activity in and under the snow was mentioned and illustrated by Seton and others, including Criddle.[1,2]

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## BIRDS OF EAST-CENTRAL SASKATCHEWAN: KELVINGTON TO KELSEY TRAIL

DONALD F. HOOPER. 1992. Publication No. 1 in the Manley Callin Series and No. 18 in the regular series of special publications by the Saskatchewan Natural History Society, Regina, Saskatchewan. 160 pp., 36 photographs, 2 maps. $8.95.

One may not be able to judge a book by its cover, nevertheless, an impressive cover can enhance both the appearance and content of a book. This is certainly the case with Hooper's publication, *Birds of East-Central Saskatchewan.* Its cover features a colour photograph of three brightly plumaged adult male Pine Grosbeaks foraging within a bare ground space that is surrounded by snow. The visual impact of the birds combined with the matching and contrasting colours within the photograph, the margins and the lettering all contribute to the appeal of this attractive cover.

The cover is not the only part of this book that benefits from Hooper's photographic prowess. An additional 36 black and white photographs are included within this publication. One image celebrates a special moment as the author holds a flightless Trumpeter Swan prior to the placement of a colour-coded collar. This collar assisted in locating the wintering area or origin of the Greenwater Provincial Park birds within South Dakota. Hooper has been instrumental in researching and documenting the changing status of this species as it apparently reoccupies its historical breeding range within this region. My favourite photographs are those which provide visual reference for both the habitat zones and the special conservation project sections located within this area. Some photographs provide important documentation of breeding. Several present Hooper with an opportunity to share his unique sense of humour by combining certain images with clever captions.

More evidence of Hooper's humour is displayed within his poem entitled "The Elusive Chicklet." This poem captures the challenge of bird identification within the context of weather, active behaviour, and various lighting conditions. In the case of the Christmas Bird Count, the poem also highlights the additional constraint of time.

Hooper's two maps, located within "The Area" section, significantly contribute to the value of this publication. One map outlines many important regional geographical features, including roads, towns, drainage patterns, lakes and altitudinal readings. A matching key enables the reader to locate these features through alphabetical and numerical cross-references. Another map displays the boundaries of this area's habitat zones upon its surface. These zones are cross-referenced with brief paragraphs that identify indicator tree and plant species, describe typical sites, and discuss historical events that have modified several habitats. An adjacent section discusses several regional conservation projects by outlining their size, specific locations, and special geographical and ornithological characteristics. This section also describes historical events surrounding the origins of these projects.

Another interesting subsection chronicles the personal histories of the Hooper twin brothers (Donald and Ronald) and their many contributions to the study of natural history within the province. Next, Hooper acknowledges a large number of people who have shared their observations and records to create the data base for this publication. It is evident that these records cover the span of many years. This impressive list of contributors includes biologists, naturalists, trappers, public officials, farmers and homemakers. A special subsection recognizes several persons for their major contributions, through the broad scope of their research and records.

A useful section contains a chart which assigns a status to those birds which are "confirmed," "probable," "suspected," or "possible" breeders within the region. This sectional chart creates a baseline that challenges subsequent observers to clarify or change these designations through additional records.

Another brief section summarizes information collected from 1978-91 during the Somme Christmas Bird Counts. Again, this data is presented within a chart, enabling the reader to grasp trends in both the patterns of occurrences and numbers of birds found during these events. This section also contains a list of all Christmas count locations within this region.

The major section of this publication contains the "Species Accounts" which documents the status of the 286 species that have been recorded within this region. Each species is classified using the common and scientific names as assigned by the *American Ornithological Union (AOU) Checklist*, including various updates. Breeding birds are assigned a status as permanent or summer residents. Accounts of non-breeding birds include the seasonal reference of summer, spring/fall, or winter visitors. Transient status is given to passage birds which migrate through the area in spring, fall or both seasons. Each species account features one or more brief paragraphs summarizing all records and other pertinent information. Breeding data is included if proven or suspected. Transient and breeding species accounts include dates of early arrivals, spring departures and early and/or late departures. These concise yet comprehensive accounts are an excellent source of information.

Species abundance codes are based upon the probability of observation while visiting the correct habitat during the appropriate season or seasons. These codes include: abundant, common, uncommon, rare, and irregular (very rare, not present every year). This last designation - irregular - is used to describe the status of a substantial number of species. In some cases, this status is assigned to species which are very much out of range. Birds such as Rufous Hummingbird or Lewis Woodpecker are probably better designated as "vagrants". Others, such as Barred Owl, Chimney Swift, or Surf Scooter are more likely candidates for a "regular" status as they occur on passage or as residents in similar habitats nearby.

I understand the author's dilemma. If there are only one or two records for a species, it is difficult to assign a status without speculating as I have. Hooper has chosen to refrain from speculation and has implicitly issued a challenge for subsequent observers to clarify each status through new data records.

The final sections of this publication include: a brief section entitled "Additional Species Found Within 70 Kilometres of This Area," a detailed "Bibliography of References," a short "Botanical Index," and "Page References for All Species." An excellent "Seasonal Checklist" provides a quick summary of seasonal abundances that supplements the "Species Accounts." All of these features contribute to the value of this publication as a comprehensive regional reference.

In summary, Donald Hooper's *Birds of East-Central Saskatchewan: Kelvington to Kelsey Trail* greatly contributes to both our knowledge and appreciation of this region's rich, diverse avifauna and natural history.

Reviewed by *Bob Luterbach*, 2702 Elphinstone Street, Regina, Saskatchewan. S4S 0J7

# LETTERS

## HOW DO SQUIRRELS CARRY THEIR YOUNG?

I am providing two illustrations to show that American Red Squirrels (*Tamiasciurus hudsonicus*) may carry their young differently than European Red Squirrels (*Sciurus vulgaris*) do.

I have not seen the American Red Squirrel perform this action, but it was observed and described to me in detail be a country neighbour, who saw a squirrel which had nested in a bird nest box move its young to a more spacious spot. As my sketch suggests, the youngster is clinging to the belly of the adult with its head below the adult's crotch (see figure 1).

The European squirrel carries its young by its mouth, aided by a pair of the youngster's legs clinging to the parent's neck (see figure 2). Bears (and I expect some other carnivores) also carry their young partly in their mouths. The illustration of the European squirrel is reproduced here from: T. Bourliere. 1960. *Natural History of Mammals*, 2nd Edition. Alfred Knaps, New York. p. 178.

- *E. Otto Hohn*, 11511-78 Avenue, Edmonton, Alberta. T6G 0N4

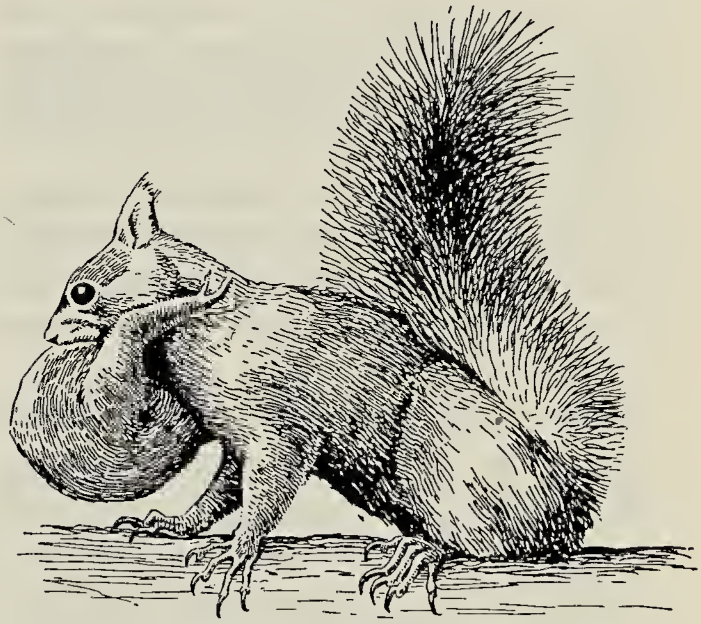

*Figure 2. European Red Squirrel with young in its mouth.*

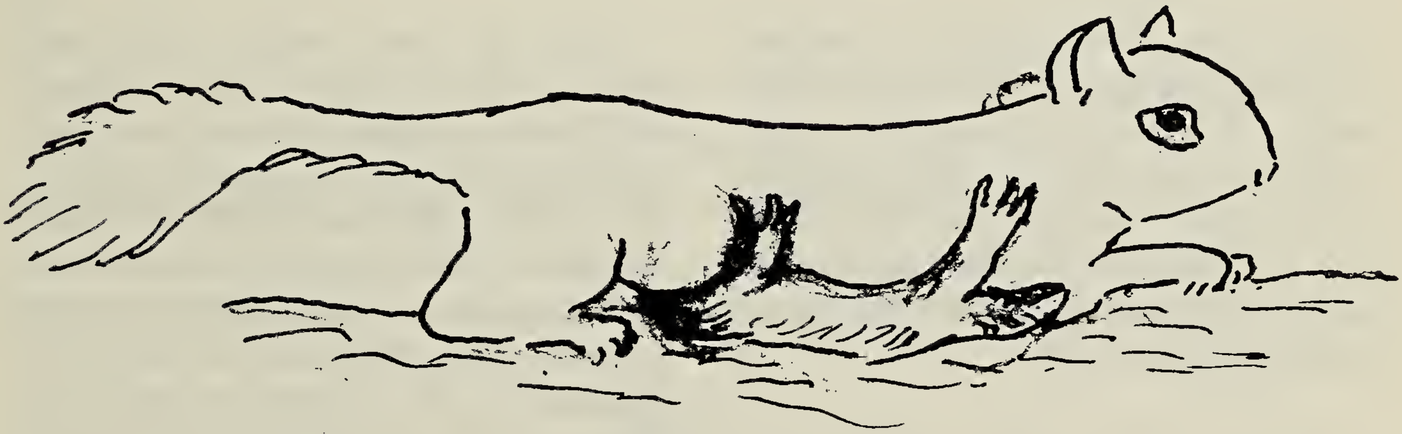

*Figure 1. Adult American Red Squirrel with young clinging to its belly.*

*E. Otto Hohn*

# EDITORIAL

Since becoming editor of *Blue Jay* in 1990, I have received several letters of concern from Saskatchewan Natural History Society (SNHS) members because this magazine was not printed on recycled paper. One woman even withdrew her membership because of it. Why was the publication of a conservation organization not doing such a simple thing to help save trees and energy?

I am pleased to announce that *Blue Jay* is now printed on recycled paper. It was first used in the March 1993 issue, and you probably did not notice any difference unless you saw the Mobius loop, the ubiquitous recycling symbol, on the back cover. The paper is called Eco Gloss (an oxymoron?) and is made of 10% de-inked post-consumer fibres (used once by offices or households); that's 10% fibre that not so long ago would have been destined for the landfill. It is manufactured acid-free and does not yellow over time. Eco Gloss is made by Provincial Papers in Thunder Bay, Ontario.

You may think that 20% recycled content is not very high. It's not too bad, considering that paper frequently promoted as 100% recycled has only 30% post-consumer waste; the remaining 70% is made up of scraps and tail ends from the paper production process.

In 1991, Tom Soder, of the Pulp and Paper Technology Program at the University of Maine, estimated that an average of 24 trees are saved for every ton of post-consumer paper that is recycled. This is based on the assumptions that the trees used were a mixture of softwoods and hardwoods 40 feet tall and 6-8 inches in diameter and that a chemical pulping process was used. A ton of paper would be about the equivalent of 2500 newspapers. Twenty-four trees does not seem like very many to me unless I imagine all the trees on my block being cut down to make paper. How many trees do you have in your yard? Or on your block? Or on your farm?

The SNHS uses recycled paper for its letterhead and envelopes. Minutes of meetings are distributed on paper copies on both sides. For *Blue Jay*, I use paper that has been used on one side and send mail in used envelopes. Authors and associate editors have even started sending me materials back in the same envelopes. You can help too by submitting articles on computer disks - it saves time in retyping and it saves on paper for draft copies.

*Blue Jay* has made a start but more could be done. Finding a Saskatchewan supplier of paper or even buying paper from companies which recycle the paper we generate would be better. The *Blue Jay* should also be recyclable, not just made from recycled stock. What sort of coating is applied to the paper to make it glossy? What about the type of ink? If you have solutions to any of these questions, please let me know (see addresses in the inside back cover).

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